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ABSTRACT

Included are 11 papers presented at the 1976 annual meeting of the National Association for Environmental Education. Papers include classroom activities, teaching value clarification, community education programs, curriculum considerations, and quality of life discussions. (RH)

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Additional Selected Papers

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## PREFACE

Due to space limitations, it was not possible to include all papers presented at the Fifth Annual Conference of the National Association for Environmental Education in Current Issues in Environmental Education - II: Selected Papers from the Fifth Annual Conference of the National Association for Environmental Education. However, both editor, Robert Marlett and the NAEE Board of Directors, have indicated that several papers which were not included are of sufficient quality and potential general interest that they deserved opportunity to be circulated. Accordingly, they have been submitted to and accepted by the ERIC Center for Science, Mathematics, and Environmental Education for announcement and availability through the ERIC system.

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TABLE OF CONTENTS

Preface

"An Archaeological Activity for the Classroom: A Summary"
by Marla Buckmaster, Northern Michigan University . . . . . 1

"A Value Clarification Model for Planning Adult Environmental Education Programs"
by Michael J. Flitter, University of Wisconsin-Madison . . . . . 4

"Developing Environmental Values in the Classroom"
by William B. Hemmer, State University of New York at Brockport . . . . 13

"A Role for Epidemiology in Environmental Education"
by John W. McDowell, Berry College, Georgia . . . . . 21

"Community Environmental Management: A Community Education Prototype"
by Thomas A. MacCalla, International Institute for Urban and Human Development, San Diego . . . . . 25

"The Quality of Life"
by Harold J. McKenna, The City College, New York . . . . . 33

"Instructional Systems Development for Competency-Based Postsecondary Environmental Health Education"
by Paul R. Mehne, East Carolina University . . . . . 37

"Alternative Energy Applications"
by Terry C. Nunneley and Margot M. Nunneley, Northern Michigan University . . . . . 51

"Essentials for the Environmental Education Curriculum"
by Robert A. Pedigo, Ida Cason Calloway Foundation . . . . . 53

"The Development of the Earth and the Quality of Life"
by Karl E. Peters, Rollins College . . . . . 57

"International Dilemmas"
by Robert N. Saveland, University of Georgia . . . . . 63

# AN ARCHAEOLOGICAL ACTIVITY FOR THE CLASSROOM
## A SUMMARY

by
Marla Buckmaster

Most of us are familiar with the term archaeology. We have seen numerous Hollywood movies starring attractive young women and handsome men, often co-starring an actor who plays the role of both the young woman's father and scientist. Throughout the movie these three overcome a series of obstacles in far off exotic places and finally obtain the ancient and valuable treasure they have been seeking. Removed from the television late movie version of archaeology, most of us have somehow gradually come to associate rocks, fossils and any unusual natural objects with archaeology. Both views of archaeology are incorrect. Archaeology is simply a series of field techniques which allows us to discover and record accurate information concerning the art, technology, adaptation, and social and ideological behavior of past societies.

These archaeological techniques can be employed by different disciplines. The adaptability of these techniques to various disciplines has helped to confuse our ideas and definition of archaeology. Archaeological techniques have been successfully employed by history, classical studies, and anthropology. Although the techniques are the same, each of these three disciplines selects and emphasizes different aspects while engaged in the field work and laboratory analysis. When the techniques are applied by someone interested in classicial studies the emphasis is on recovery and restoration of the art and architecture of former ages. The historian applies the same techniques in hopes of documenting historical accounts and obtaining information left out of former journals and records. The anthropologist is concerned with obtaining data about past life styles in an attempt to expand the range of human behavior available for study. It is this last area of research that I am most concerned with and it is to this area that the remainder of this paper will be devoted.

It is unfortunate that most of us see archaeology as the domain of a small group of specialists who emerge in obscure areas to excavate or dig, place the recovered objects in museum storage upon completing the excavation and disappear into obscurity again. Archaeology is and must be an ongoing project if it is to successfully provide the necessary data to aid us in understanding human behavior. It is also an area of research which can be just as exciting in one's own backyard as it is in far off exotic places. While I would not encourage any untrained individual to excavate or even place a test hole in an archaeological site, there is much an informed citizen can do to aid in reconstructing the culture of past societies. These things that you and your students can do include:

1. Learn to recognize an archaeological site. Many sites have surface features which are distinctive such as mounds or surface depressions. In many areas prehistoric behavior has altered the vegetation in and surrounding a former area of habitation, unusual vegetation or unnatural vegetation patterns are excellent indicators of prehistoric sites.

Artifacts such as lithic tools and pottery as well as flint chips are frequently visible on the surface of prehistoric sites. Learn to recognize these clues as indicators of past human activity.

2. Be aware when you are in the woods and/or fields. Look for these surface features which may indicate a prehistoric site.

3. Report any sites you may find to the nearest State or University Museum, or if unavailable to the State Archaeologist or your State Division of History, if the state does not have an archaeologist. In order to report your findings, you should be able to provide an accurate description and location of the area. The more accurate and precise this description the more useful your information will be. It is extremely helpful if you can provide the agency to which you are reporting your findings with landowner's name and a legal description of the land. You will need to be able to describe any surface feature or artifact you found. The size and shape of these features will be helpful information.

4. You may wish to make a surface collection if artifacts and other cultural debris are visible on the surface. This collection should be labeled with the geographic and legal description of the area, the date, and any other additional information you feel is important. Even in a museum where labeling, typing, and cataloging are a standard part of the procedure, items can become lost from the major part of the collection. Most, if not all, of the objects' scientific value is destroyed if it cannot be maintained as part of the entire collection. Each object you collect should have an identifying mark placed on it and these objects should be stored together in a safe and protected area.

5. Encourage and support archaeological programs in your area. At present many archaeological deposits are being protected by the Moss-Bennet Bill. This is a new Bill which provides for archaeological survey, excavation, and laboratory analysis if necessary on land where federally-funded projects may destroy prehistoric data. The Bill has been in effect a little over a year and has provided financial support for numerous archaeological surveys. However, the Bill provides for an evaluation of its effects after the third year. Because archaeological surveys are time-consuming and the field was not "tooled up" to meet the tremendous volume of work connected with federally-funded projects many projects have been held up for considerable periods of time. There is much pressure to have the Bill rescinded. Public support will be necessary if it is to survive.

The five areas in which your help is needed did not include excavation of prehistoric sites. It is not impossible for you to become involved in site excavation. However, any site excavation or dig should be under the direction of a trained field

archaeologist. Excavation provides data in many forms and unfortunately the amateur or other interested person often destroys more than he or she recovers. The recovery of artifacts or objects made by prehistoric man is frequently the major goal of the amateur yet artifact recovery is only a minor part of archaeological field work. In addition to artifacts the trained archaeologist looks for stratigraphy, fauna, flora, past molds, archaeological features, and carbon-14 samples, etc. I have a series of slides which I would like to use to show you this wider range of archaeological data. I would like to encourage you to ask any questions you may have or make comments while the slides are being shown.

6. The sixth area where you and your students can be helpful on the field of archaeology is in preserving the archaeological record by discouraging the destruction of archaeological sites such as the Riverside site. As you have seen in the slides, much data is available with thorough careful excavation. However, careless or frequent 'pot hunting' can destroy this data. It is only by understanding the nature of archaeological record that it will be preserved and provide exciting and stimulating knowledge about earlier societies.

# A VALUE CLARIFICATION MODEL FOR PLANNING ADULT ENVIRONMENTAL EDUCATION PROGRAMS

by

Michael J. Flitter

I propose in this paper to present to you a model which has as its central theme, Value Clarification on a personal and group level as a basis for construction of Adult Environmental Education programs. As a preface to this topic, we first need to recognize the urgent crisis that humanity faces today ...

It is my conviction that we must make drastic changes in our whole way of thinking ... or perish. At the heart of this matter is the fact that industrial man's values and priorities have led him to exploit and conquer his environment, rather than live in harmony with it. Our society needs an entirely new outlook; today's individual citizen must be educated and enabled to assume his rightful responsibility in maintaining a healthy environment .... but how? In this work, we can now start with this question, roll up our sleeves, and enter the more practical realm of making concrete proposals.

It goes without saying that we are in a dilemma in our times .... experts and leaders in the areas concerning man's relationship to his environment have been flashing many warnings, and it is becoming increasingly evident that they are right. And yet, we are "officially" enjoying more prosperity than ever before, and are highly optimistic about our future well-being. As we study this discrepancy, we must ask ourselves the question: "What kind of education is relevant in this moment of history? In our day, when it is so important for us to understand the fitness of the environment, and the interdependence of organisms and of men, what kind of education is needed to secure sanative environments and sane men?" (Brandewein 1966)

We can begin by assuming that man must first learn the facts about the biological basis for his life, and then bring his politics and economics into line with these facts. This is not an individual problem; it requires the united effort of society as a whole. We have a problem; we can solve it, if we work together, and show wisdom and self-control by putting the good of society above individual interests.

The first step in our united effort is thus seen to be education: planning, developing and implementing the education of concerned citizens towards their environment. Much long-overdue concern for the environment has developed recently, which has led many schools and youth groups to organize programs of environmental education for young people. This development is sorely needed in relieving our crisis, but so far little attention has been paid to planning similar learning opportunities for adults. With this need in mind, I propose a philosophy and method of planning adult environmental education programs.

Before making proposals, however, the history of environmental education should be reviewed. Over the years, our nation's schools have always dealt, to some extent, with human-environmental relationships, but the focus was usually

quite narrow, and educators generally failed to teach the whole picture of the complex relationship between man and his habitat. Only a handful of men, such as G. P. Marsh, were able to discern that a real problem was developing. The turn of the century saw the development of the classical Nature Study concept, which emphasized the sentimental and aesthetic values that tie us to our environment. This concept, unfortunately, had waned sadly by the 1920's, and with it environmental concern. In general, education was slow to accept the importance of real environmental education, but it has, gradually, and we have at last today environmental educational concepts which are all encompassing, treating the entire man/environment picture. Soil conservation, water conservation, and wild-life conservation, etc., are no longer treated as separate subjects, but, rightfully, as parts of a united whole -- the complex ecological relationship between man and his environment.

Some basic characteristics of this new environmental education can be discussed here, but the focus must center essentially on developing values and attitudes which will enable us to live in harmony with our habitat, and to preserve it for our children. For this reason, the underlying theme that characterizes today's environmental education is the heavy emphasis put on the affective dimension (motivation, appreciation, awareness), rather than on merely imparting facts.

In the development, then, of my model for program planning, my next step is to develop, validate, and organize these concepts for teaching conservation. As Yambert (1961) observes, there, in the field of conservation, currently no "axioms," or "laws," such as exist in the study of physics, mathematics, etc. To fulfill the need for these axioms, I use the conservation education concepts developed by Dr. Robert Roth (Fundamental Concepts for Environmental Management Education, K-16, in the Journal of Environmental Education Vol. #1, No. 3, Spring 1970). These concepts fit well into my model of adult education, as they serve to help the learner and facilitator to limit and define their goals.

Of prime importance here is the development of value clarification techniques. These techniques are basically designed to encourage each individual in a given group to examine his set of values and beliefs, to clear areas of confusion, to enable that person to develop his own rational, consistent set of values based on the facts, and to possess the conviction to live according to these solid values. As individuals clarify their values, the group as a whole has a basis for working together rationally.

We need to realize that our environmental problems are rooted ultimately in our human attitudes and values. Pollution and other problems are only symptoms of the real problem -- a widespread errancy in our set of human values and attitudes. The terms "attitudes," "values," and "belief" are fundamental here. For example, if a person believes economic growth is essential to our survival, and the value of survival is of great importance to that person, it will be extremely difficult to change that person's reverence for the dollar. If that same person believes a balanced environment is essential to survival, and that overproduction, consumption, and waste will destroy that essential balance, he might value the dollar less. It is necessary, therefore, to make environmental quality one of our most centrally located and strongly held social values if we are to resolve environmental conflicts. We could at this point look deeply into the principles of social Darwinism which Dewey sets forth and so conclude that it is our educational system which can have a great impact upon clearing up our attitudes ... but how?

The traditional methods of dealing with values are modeling, moralizing, inculcating, and the laissex-faire approach. But, rather than teach, inspire, appeal to the conscience, or impose rules upon the learner, the value-clarification approach is aimed at helping the learner examine his own values, and to clarify and develop a solid, consistent set of values of his own. This includes seven sub-processes: (1) choosing from alternatives, (2) choosing after thoughtful consideration of consequences, (3) choosing freely, (4) prizing and cherishing, (5) publicly affirming and appropriately sharing, (6) acting upon, and (7) acting upon with some consistent pattern and repetition.

Educational institutions have a legitimate right to use this technique in dealing with controversial issues. The teacher must be careful, however, not to impose his own values on the learners, but to encourage their free expression of values. Interacting in small groups then helps to clarify and reinforce strong, healthy convictions.

I feel that persons exposed to this value-clarification approach will become more zestful and energetic, more critical in their thinking, and more likely to follow through on decisions (Simon, et al., 1972). They will more clearly have a sense of direction in life, the strength and conviction to do what they want, and will gain more pleasure out of living. Although a divergence of values is likely and even encouraged, and many mistakes can be expected, most people can be expected to have the innate wisdom to develop rational and healthy attitudes, which is really the heart of the matter.

In realizing that adult education is different than traditional schooling and must be approached accordingly, a basic philosophy of adult education must be formed which points out its several unique characteristics. For one thing, adult education works best when there are no constraints or pressure as in conventional education. Another important aspect is the active participation of the learners themselves in planning and implementing the program. There are many various methods and specific steps in starting and developing a program of adult education in a community, and in implementing that program. Rather than take time now, I would invite you to refer to my thesis in which these are dealt with in more detail. Mainly, though, participation by the local learners is seen as essential in every step. Not only will this result in a better program, as laymen usually have much to offer, but these learners will also show greater interest and will learn more if it is their program.

Nor is the role of the natural resource specialist to be underrated. It is his natural right and duty to use his position and knowledge of environmental conditions to influence local citizens as they develop values and attitudes. The community needs the natural resource specialist to help it in assessing both its environmental problems and resources. The community environmental inventory is an important aspect of adult education. This is an awesome project to tackle, but well worth it, and well within the reach of a concerned community...Again, this is best accomplished by a group of local citizen learners.

Aldo Leopold's Land Ethic is quite valuable at this point as a model of the goal to be accomplished which is to develop ethics and values which give priority to the well-being of the total environment.

I have now reviewed the history of environmental education, discussed the technique of value-clarification, and gone through the steps in planning a program. At this time I would like to illustrate and explain my proposed model for adult environmental education. The last step, I believe, is the most important, as it ties into one unit all that we have looked at so far.

But, first, I must point out, that, although I have been focusing all along on environmental education, I feel that this model is applicable to all adult education and non-traditional educational programs. Indeed, in my paper I repeatedly state my belief that environmental education itself must not be treated as a distinct subject matter, but incorporated into all other programs of education. So let us look at this unique model, as relevant to all non-traditional forms of education.

I propose my model here as a tool to help the adult educator plan his educational program as an important public activity. Because of the public, or social nature of this type of educational process, the model takes on a much different appearance than traditional educational approaches. The heretofore distinction and separation between the content of educational concepts and the active process of program planning has been dissolved and the two complementary factors integrated. Content and process are found to be inseparable in adult environmental education; content is not possible without process, and process is not possible without content. Value-clarification techniques, as discussed earlier, are proposed as the link that binds content and process. This unique model of adult education planning processes, then, becomes a unified whole, and is presented as expanded "block" or "three-layer cake" as this diagram illustrates.

The fourteen basic units or stages of the model are: (1) the learner or clientele, (2) the problem situation, (3) the educator or facilitator, (4) environmental education concepts - the content, (5) value clarification techniques consisting of the functions of choosing, prizing, acting, feeling, thinking, in a continuous cycle, (6) identification and clarification of the problem, including the community environmental inventory, (7) consideration of alternatives, (8) selection of specific resources needed for each stage of the program, (9) selection of one alternative, (10) specific learning experience design, (11) implementation of the program, (12) program evaluation, consisting of purpose, criteria, evidence, judgement, effect, and analysis, (13) screens, consisting of institutional, organizational, economic, social, or other constraints acting as forces on the educator and his/her clientele as they move through the process of program development. This screening action breaks down the ideal solutions to the real solutions that can be achieved by the interacting learners and facilitators. The screening action takes place between each of the units of stages of the program planning process. Each screen may cause the facilitator to move out of or into the cycle of planning. Each screen may bring up new alternatives that may cause the group to move back to Unit 7, or the screens may show the need for more specific resources for solving the problem. These specific resources could be resource people, such as specialists in a technical or scientific area. The resource people may enter the planning after the learners have reached any of the stages from numbers six (clarification of the problem) to ten (specific learning experience design). The new resource person may also enter in stage eleven. For example, if the program is a "regional plan", the resource people would be physical and economic urban and regional planners. The program might be to improve communication among clientele groups and the new resource person might be a journalist. As this model will in reality be dynamic and constantly changing, the facilitator and learner may also enter and leave at various stages. Although the typical learner will hopefully move through all fourteen stages, there are in reality an innumerable number of possible routes.

Values clarification is the bridge between the educator's body of content and the information the learner might wish to receive. Values clarification is the tool the learner uses to define his/her involvement in each stage of the program planning process (units six through eleven).

Stage fourteen of the model points out that one program completed simply leads to more unsolved problems or more questions to be answered.

The cycle of program planning will begin again with new educator-learner interaction over a problem situation or a question to be answered.

To illustrate the model in use, I would like to cite an actual situation, involving electrical industrial corporations in the Midwest in favor of large nuclear plant developments, and old-line environmentalist groups strong against this. As bitterly opposed as these two groups were originally, they were able to form a temporary coalition, originally as a pulpit for each to preach its message to the other. This gave a group of adult educators the opportunity to set up a series of meetings using the techniques of values-clarification. After much interaction and consideration of their person values, the 30 learners, members of the coalition, agreed that there were really very small differences in their individual priorities, with the result that both sides have moved closer to center from extreme positions. Although not in total agreement, the two groups now have a common base, and have found it possible to identify specific problems of mutual concern and decide upon courses of action. This coalition has become a model for other power pools in North America and Europe because of its apparent success; for us this example serves to illustrate the importance of values clarification in bridging polar and non-polar positions, and affecting rational courses of action. The key is for each individual learner to openly disclose and discuss his/her feelings, so that a common base for learning can be laid.

In conclusion, I would present my model here as the framework within which individuals acquire attitudes and values on the basis of sound scientific fact, and, in turn, as a tool with which a community can come to grips with specific environmental problems. These local problems will be solvable only when local citizens have solidly clarified their values as a basis for decision-making. When the citizen learners thus understand their own values, they will be able to understand their place in the ecology of the community. Once values have been clarified, mutual trust can be built through learning and working together in an environmental education program. It is on this solid base of trust and cooperation that specific problems can be solved one at a time, and that our society can eventually come to fulfill Leopold's Land Ethics. I propose this model then, as a practical tool to affect this cooperative effort. It is an awesome task, but well within our grasp if we can work together, abandoning our vested interests and embracing a realistic world-view.

Our survival depends upon it.

Value-clarification is not a passing fad in education today. It must move from a "games set-up" to an integral part of all program planning. The antique system of values and priorities that we hold so dear is unable to cope with our explosive new age. Under the same status-quo set of ideals that has governed our systems of education, science, politics, and social interaction for so long, industrial society has painted itself into a corner: This system has allowed man, in the name of "religion" and for the sake of "progress" to rape Mother Earth, to keep minority groups under unjust oppression, and to reduce individual humans to little more than cogs in the giant machine of life. This same set of values now threatens to undo us--the rich and powerful as well as the poor and the oppressed--unless we effect some drastic changes in our whole way of thinking as a society. Our age needs a patron saint of sorts--a model to help us reshape our thinking, like Francis of Asissi who assumed a pastoral care for creation, and enjoyed a loving relationship with all his fellow creatures, whether man or

beast. To take radical steps in relearning how to live with each other and with our environment will require much courage, but to ignore the urgency of our state would spell sure disaster. The risk must be taken. Let's all work together on helping our fellow humans to understand our values and therefore reshape the earth.

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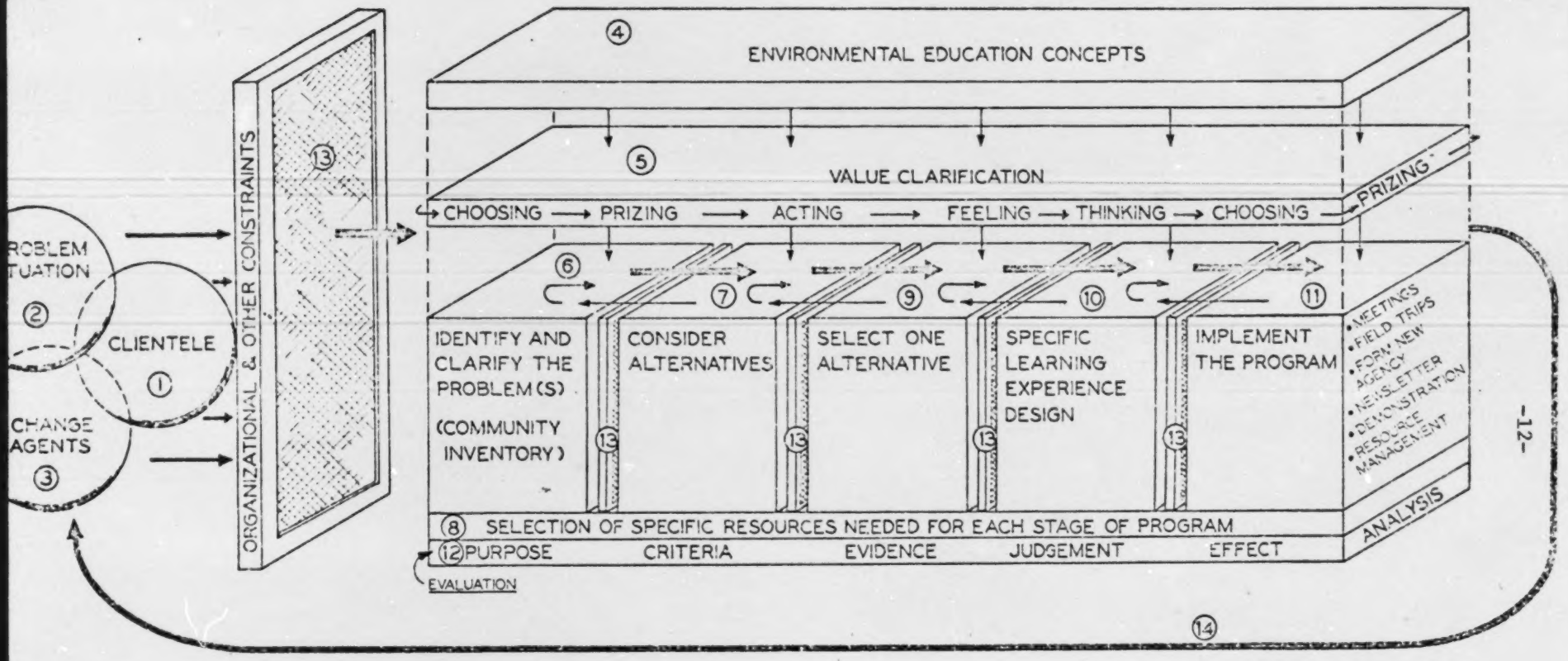
ADULT ENVIRONMENTAL
EDUCATION PROGRAM MODEL

BY MICHAEL FLITTER




-12-

# DEVELOPING ENVIRONMENTAL VALUES IN THE CLASSROOM

by
William B. Hemmer

Why should our students work for a better environment? Lawrence Kohlberg's work in identifying stages of moral thinking or valuing helps to answer this question. Kohlberg's theory has implications for environmental education because the task of attaining the affective goals of environmental education become easier, if students are assisted in obtaining higher levels of moral reasoning. To do this, teachers must provide students with opportunities to make moral decisions concerning environmental problems.

The application of Kohlberg's findings to environmental education also helps to attain affective goals, such as willingness to live more in accordance with the needs of the natural environment. Analysis of case studies of national or world environmental problems, and of local environmental problems provide a focus for moral reasoning. The objective of these strategies is to raise the basis of the student's valuing from selfish craving for reward or fear of punishment toward based on belief in universal principles of justice, equality and dignity for all.

Lawrence Kohlberg, a Harvard pyschologist, has conducted research and experimentation spanning nearly a quarter of a century on the moral bases of human reasoning. His studies of reasoning have included samples of people from a variety of cultures throughout the world. As a result of this research, Kohlberg has concluded that individuals develop their reasoning about matters of morality along an unchanging sequence of levels and stages. As the individual increases in moral maturity, he progresses upward along this continuum toward more psychologically and philosophically rational stages.[1] The educator's purpose in teaching moral reasoning is to help students attain the ability to operate at the higher stages of reasoning.

The individual in early primary school begins on the lowest level and progresses toward the higher stages. The teacher may assist the student to attain the higher stages of moral reasoning at the proper stage of his development by exposing him to the higher stages of reasoning in group discussions.[2]

The procedure used in moral reasoning involves presentation of value-laden situations or dilemmas.[3] Leading students through a process of becoming familiar with a problem through careful analysis of the situation, the teacher urges students to state a position regarding what should be done. The student then develops a rationale for this position. The students discuss the various alternatives and the rationales for each of the positions

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[1]Ronald E. Galbraith and Thomas M. Jones, "Teaching Strategies for Moral Development," Social Education, 39 (January, 1975), 16-22.

[2]Lois A. Mattox, Getting It Together. (San Diego: Pennant Press, 1975), p. 17.

[3]Ronald E. Galbraith and Thomas M. Jones, Moral Reasoning: A Teaching Handbook (Anoka, Minnesota: Greenhaven Press, 1976), p. 35.

presented. The teacher also asks questions to test the students' reasoning and they are then invited to reconsider their positions again individually after hearing others in group discussions. The hope is that students, hearing higher level reasoning being used by some of the other students will themselves accept and adopt for their own use such higher level reasoning. In time students will begin to use the higher level reasoning by themselves when confronted with a new but similar situation.

## KOHLBERG'S STAGES OF MORAL REASONING

Kohlberg, in his theory of cognitive moral development, identifies three levels of moral reasoning consisting of two stages each. A brief description of each of the levels and stages follows with examples drawn from environmental education.

### Level I: Pre-Conventional

At this stage the individual judges things right or wrong in terms of the consequences of punishment, reward or exchange of favors. He also responds to the physical power of various authority figures.

Stage 1: The individual at this stage attempts to avoid punishment and gain rewards. Great respect is shown to authority figures who wield great power in the eyes of the individual.

Examples:

He shouldn't throw trash along the highway because, if he gets caught, there is a $500 fine.

He should use solar power to heat his house because oil and electricity are expensive and he could save a lot of money.

The factory owner should dump his untreated water into the river because his chances of getting caught are few and the fines he would pay are much less than it would cost to install the necessary anti-pollution controls.

Stage 2: The individual at this stage makes decisions in terms of maximizing the satisfaction of his own needs and possibly of others. Fairness, equal sharing and a return of favors are considered in a pragmatic manner.

Examples:

I would buy the non-returnable bottles because carrying the bottles back from the picnic wouldn't be worth the effort for us. This way none of us will have to carry anything back.

The factory owner shouldn't install scrubbers on his stack because, after all, the air he's getting isn't good to start with. The other plants in the area are polluting his air too. His pollution isn't going to make that much difference.

He should put in a septic tank because the others all have them. If he didn't pollute the pond, then he and everyone would be able to swim there.

Level II: Conventional

The individual at this level reasons on the basis of fulfilling the expectations of family, group or state. A strong desire to maintain, support and justify existing society is dominant.

Stage 3: Persons at this stage try to conform to expectations of the group in order to be fully accepted and win approval. Intentions become important at this level.

Examples:

You can't blame him for having many children because all families in his culture are expected to do this.

A person shouldn't play loud stereo music late at night because his friends and neighbors will be annoyed and consider him kind of a nut.

Industries in underdeveloped areas should be allowed to pollute a little because they are just trying to provide jobs and bring money into the area.

Stage 4: People at this stage reason on the basis of a strong desire to maintain existing rules, regulations and social order. Law and order for its own sake is valued.

Examples:

We should not set up agricultural zones, because this restricts the way people can use their own property.

We should report all violation of the smoke ordinance to the proper authorities immediately.

He should not be allowed a zoning code variance. After all laws can only protect us when they are enforced. We can't afford to make exceptions.

Level III: Post Conventional Level

Moral reasoning at this level reflects universal moral values and principles which are recognized as higher in validity than the authority or rules of groups. The higher moral authority takes precedence over the laws of man and society.

Stage 5: At this stage there is recognition of a social contract in concurrence with all society that takes precedence over ordinary law. People at this stage examine the possibility of changing the laws to conform with higher contractual obligations of mankind.

Examples:

People should engage in illegal protest marches in this case because the right to a clean environment is being threatened.

We should not deny the third world the use of DDT because they are threatened by debilitating or fatal malaria without it.

The permit allowing this nuclear plant to be built, although legal under present law, should never have been granted. The safety of the people in the community will now be needlessly threatened. We must protest vigorously with every means available to us.

Stage 6: Persons at this stage follow their conscience in accordance with universal ethical principles, such as justice, human equality and respect for the dignity of mankind. Decisions are made on the basis of an obligation to follow such principles (e.g., the golden rule).

Examples:

We should limit family size by law on a worldwide basis because the survival of all humanity on this planet takes precedence over the individual's unlimited right to have children.

We should limit the consumption of scarce energy resources now for the sake of future generations. The future world population has a right to expect a just share in the resources of the world.

The wealthy nations should be willing to lower their standard of living in order to make it possible for all the world's population to have a just share of the world's riches.

## APPLICATION OF THE THEORY

### Cultural Influences

Research by Kohlberg and his associates indicates that people in such diverse cultures as those found in middle classes in the United States, Taiwan and Mexico develop moral reasoning according to the same stages as those in lower classes in Turkey and the Yucatan.[4] Such cultural influences as social class, education and religious background do not seem to change the orderly progression of stages followed.

### Development of Moral Reasoning

Individuals move through the various stages in progression, passing through the preceding stage before moving to the next higher stage without skipping any stages. Each stage subsumes the reasoning found at each previous stage. A person can understand and be attracted to the reasoning at the next higher stage. Development of moral reasoning occurs gradually as the person decides the reasoning at the higher stage is more logically satisfying and adequate. Often a person is in transition between stages and may exhibit reasoning which consists partly at one stage and partly at the one just above it. It is entirely possible for an individual to remain for long periods of time, or permanently, at a point between stages. Constant revision and restructuring of a person's moral reasoning at the next higher stage is necessary for progression from one stage to the next.

### Rate of Progression

Individuals differ in the rate at which their moral reasoning progresses and in the highest stage attained. Most persons move through the Pre-Conventional Level by adolescence, while adolescents tend to be at the Conventional

[4]Ronald E. Galbraith and Thomas M. Jones, Moral Reasoning: A Teaching Handbook (Anoka, Minnesota: Greenhaven Press, 1976), p.32.

Level. But less than 20% of adults actually attain the Post-Conventional level. Kohlberg describes Richard Nixon ". . . as a man who in his abridgement of individual rights in the name of law and order never rose above stage-four morality." Kohlberg also added that Nixon never really ". . . understood the U.S. Constitution, a stage-five document."[5] Thus, individuals may stop developing at any level.

Research on Moral Reasoning

Research indicates that moral reasoning cannot be hastened by teaching the stages as a set of maxims or beliefs. They must be attained by a process of moral maturity through analyzing numerous dilemmas and deciding upon an acceptable course of action which should be taken. As an individual's moral reasoning develops, more perspectives are taken into consideration in the analysis process. Limited research on student activism indicates a correlation exists between the individual's action and his stage of moral development. Kohlberg's classroom research indicates that students participating in regular classroom discussions of moral dilemmas begin to use reasoning at higher stages of development. Active discussion with others at adjacent higher stages seems to be crucial in this development.[6]

Classroom Climate

In order to provide the proper classroom setting for the development of moral reasoning, the teacher must provide an accepting atmosphere where students are not afraid to speak out about their most cherished beliefs. Not only the teacher, but other students in the class must learn to refrain from ridiculing or putting down students whose beliefs differ from theirs. The teacher must also keep from censuring students for low-level reasoning. A happy medium between a free wheeling give and take discussion and a highly structured discussion must be sought. The teacher must insure that students go through a proper analysis process and then focus on the reasons for choices.

Teacher's Role

The role of the teacher is a delicate one, most properly described as facilitator. He must take care not to dominate the discussion or to expect certain responses to his questions to the exclusion of all others. The teacher must encourage students to talk to each other, not through the teacher, and to listen to each other. He must exhibit a sincere interest in listening to the comments and reasoning of the students. The teacher must not moralize or try to inculcate his own values nor foster the impression that all values are personal matters of equal worth. Kohlberg says,". . . we do not agree that all values are relative nor do we teach children value relativity, which in its strong sense is an unsound doctrine . . ."[7] Instead the student is encouraged to examine various alternative courses of action and examine their possible consequences so that a rational choice may be made.

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[5]Kenneth L. Woodward and Mary Lord, "Moral Education," Newsweek, (March 1, 1976), pp. 74-75.

[6]Ronald E. Galbraith and Thomas M. Jones, Moral Reasoning: A Teaching Handbook, (Anoka, Minnesota: Greenhaven Press, 1976), pp. 34-35.

[7]Lawrence Kohlberg, "Moral Development and the New Social Studies," Social Education. 39:5 (May, 1973), p. 374.

## CLASSROOM PROCEDURE

### The Dilemma Story

The dilemma story should be built around a topic which is pertinent to the students. It can be constructed around an environmental problem which exists in the community and which particularly affects the lives of the students. For example, the unavailability of places to swim because of the prevalence of high pollution levels in all suitable bodies of water. The situation presented in the dilemma should appear real or genuine to the students.

The dilemma should focus on one or a few primary characters who are faced with making a crucial choice between two alternatives neither of which is an easy, culturally approved alternative or "right" answer. Moral issues can revolve around social norms, human rights, personal conscience, property rights, authority, truth and punishment. Each dilemma ends with a question asking about what the character should do.

### Using the Dilemma

After students read the dilemma or listen to it, the teacher helps the students to clarify the facts and details of the story, making sure students can state the dilemma of the central character. Then the students are asked to choose a course of action that the central character should take. The teacher then polls the class on which choice each student made. This is necessary to see if a good difference of opinion on the course of action to be taken exists. A disagreement helps to insure that students will discuss completely their reasons for the choice made.

If not enough disagreement exists (less than 1/3 of the class on one side), the teacher presents additional facts to the original dilemma story. The additional facts are designed to sway some of the majority to the minority side. These additions consist of more data, not previously known to the students, which are added to the original story to be considered. Additions must be prepared in advance and held in abeyance until they are needed. The additions can be used at later stages in the procedure, if needed, to spark additional controversy.

Students are then encouraged to discuss the dilemma with the teacher acting as facilitator, asking probing questions which encourage the students to talk. Small discussion groups can be formed at this point in order to give all students the maximum opportunity to participate. Some of the probing questions may be designed to get the students to think of the moral issues of the situation. Other questions ask the student to put himself in the position of some of the other supporting characters of the dilemma and decide what he would do. Finally the teacher asks students to consider the broad consequences of what they are advocating. For example, what would be the implications for the world environment, if everyone enjoyed the same standard of living that Americans enjoy?

## MORAL REASONING AND ENVIRONMENTAL EDUCATION

The field of environmental education abounds with questions and issues around which ideal dilemmas can be constructed. Take, for example, this question: "Shall we accept responsibility to be the stewards for future generations of humanity and change our priorities and life styles accordingly or

shall we enjoy our lives to the fullest today, with no thought of what tomorrow may bring?" In answering this question, moral reasoning at one stage or the other must help us in the choices that must be made. There are many alternatives which could be chosen. What are the consequences of the various alternatives? Which will we choose and why?

Environmentally concerned teachers can also focus on more limited aspects of the environmental crisis. Some might consider these questions to be the basis for many dilemmas:

> Should a nation give up some of its sovereignty to an international government empowered to allocate the world's scarce resources and control pollution?
>
> Should an industry put a higher priority on social responsibility than on profits?
>
> Do all people have an inalienable right to a decent standard of living?
>
> Should we expend scarce resources for reducing pollution levels or should we use them to raise more food for increasing world populations?

As our students discuss the dilemmas these crucial questions present, they may notice that more satisfying reasoning, from a philosophical point of view, is found at the Post Conventional Level of moral reasoning. The challenge for us as educators is to help our students attain the ability to reason on as high a level as possible. For, in the years to come, they will be helping to shape the answers to the crucial dilemmas of their time. Let us hope that the real answers to future environmental dilemmas will be found by moral reasoning based upon the highest ethical principles of the Post Conventional Level and not upon the more limited, selfish, parochial considerations of the lower levels of moral reasoning.

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# A ROLE FOR EPIDEMIOLOGY IN ENVIRONMENTAL EDUCATION

by

John W. McDowell

A major goal of environmental education has been to develop environmental awareness leading to attitudes and values needed for appropriate environmental management. From epidemiological thought and procedure emerge a number of considerations which directly relate to attitudes and values needed for adequate environmental management. Study is primarily focused at the local level where the interplay of physical and social factors determine environmental quality, and secondly it is an objective inquiry into cause and effect.

As most of you may know, the term epidemiology simply means the study of something imposed upon a population, for example measles upon a population of school children. Usually when speaking of epidemiology as a field of study we extend this definition to mean something within a population as well as upon a population, as the common cold which is endemic or always present to some degree in a population.

By mentioning these definitions, I wish to bring out that epidemiology is a study of populations and what is happening to these populations as a result of some exposure to, among other things, an environmental agent causing disease.

We can think of this science in purely statistical terms, involving sophisticated forms of modeling, sampling and analysis or we can think of it as the study of effect and cause in the natural setting where the disease is occurring. The latter approach is often called field epidemiology or more suitably "shoe-leather epidemiology." This approach recognizes the need for "on the spot" analysis involving collection of data and a study of local social behavioral patterns as they would affect the transmission of disease.

Through the organization and methodology that has evolved for field epidemiology, it is possible to convincingly demonstrate objective and workable procedure for the solution of a number of environmental problems. This is particularly important at the present time since environmentalists are continually being accused of subjectivity and bias or are being saddled with laboratory devised procedure which if workable in the field is workable only on a limited scale. Of equal or greater importance is that epidemiology focuses on the necessity to recognize pathology in the environment when it occurs and the data base necessary for such recognition and determination of cause. A major deficiency in establishing environmental standards or assessing the environmental, social and cultural influences relating to disease has been a lack of sufficient input from the local level[1,2]. To establish the amount of input desired would require better public recognizance and support of the type of monitoring or surveillance needed at the local level. Such would necessitate a redirection of attitudes and values.

For the past four years epidemiological field investigation has been incorporated into the environmental health course at Berry College. During the

past year we have added the use of census tract data to our epidemiological program. The total program currently consumes four of ten laboratory periods alloted to the course. Students are particularly receptive to this type of study, mainly because it is problem oriented and gives the opportunity to observe the interplay of all the physical and social factors that go to make up an epidemic. We are particularly thankful to the Bureau of Training of the Center for Disease Control, USPHS, for the loan of materials that has made much of this enthusiasm possible.

At this time I would like to more fully explain and illustrate the content of epidemiological study. By this procedure I believe you can best understand the attitudes and values that can be developed through this type of study.

A field investigation is basically the attempt to establish the time, place and person association which produced the unusual incidence of disease or the epidemic. This approach has been mandated by several considerations. The isolation of a disease agent whether infectious, chemical, or social does not necessarily reveal the most important cause of the epidemic. i.e., the means by which the agent is entering the population nor the procedure which would bring about its control. In fact, in some instances it is almost impossible to identify an agent until you have worked out the syndrome or pattern of transmission.

One of the first procedures in study is to determine the number of cases involved in an outbreak or epidemic. Every possible means, interview, telephone calls, etc., are used to determine this number. The larger the number of cases (the so-called numerator) usually the more reliable your analysis. Once the numerator has been established then it is necessary to establish the time sequence for the onset of illness. The major question is: Did the majority of cases become sick at about the same time? If they did, then we would be looking for some common source, one to which a number of people were simultaneously exposed. If not, then we might be looking for a propagative source, one in which infection is derived from personal contact with an infected person, i.e., the old principle of contagion. An environmental source is most likely to be a common source.

We determine this time relationship by the construction of a histogram, plotting number of cases against some aspect of time such as hour, day, week, or month depending upon the duration of the epidemic. This histogram will show any cluster of cases in time. Sufficient cluster, strongly suggests that the cases were simultaneously exposed and would direct your attention perhaps to water, food, or some other environmental agent to which a number of people might have had common exposure.

The next two aspects of study basically involve the "search for the common denominator." We have mentioned number of cases as the numerator, and we must now relate these cases to the various denominators which will enable us to determine place and person. To accomplish this we construct rates on the basis of cases over population at risk times 100. This is commonly called the "attack rate," and the skill involved is the proper study of the cases as they are occurring within specific denominators relating to place, sex, age, occupation, etc.

For the "location of things in space," i.e., the study of case distribution in the hopes that some common pattern will emerge, we can use several procedures. We could use the time honored method of pins on a map, or we could use, what in most circumstances is a more suitable procedure, namely the comparison of attack rates constructed on the basis of various geographical features. This could be used to relate cases to census tracts, school districts, other institutional settings within the environment, sewage or water lines, etc. A good example would be the relating of a number of food poisoning cases to a particular restaurant, church picnic, central kitchen for a group of schools, etc.

Another requirement in addition to the time-location sequence is to examine by person. When we think of person we can think of age, sex, occupation, ethnic origin and any number of other factors which would serve to provide means of distinguishing between people. For example, cases of human brucellosis, a disease formerly transmitted through milk, may have little in common as to location within a community, but an examination of age, sex, and occupation would establish that human brucellosis is now an occupational disease found mainly in male adults working in meat packing plants.

I have attempted to show that the relations in time, place, and person are important in determining cause of disease, pathology or disorder, and that the procedures utilized are simple enough to be applied by most anyone with a little training and experience. The main ingenuity required is environmental, namely knowledge of the community. One must relate time, place, and person to a particular event that occurred within a community. It is the writer's belief that this problem approach based on actual events as they occurred within a community is a necessary part of environmental studies. It not only serves to relate things occurring within a community, but most important of all it provides an objective procedure for doing so.

Just one step removed from the community problem, backed with raw data based on interviews and inspection, is community study by means of census tract data. To relate to more general causes, particularly in a large community, it is often necessary to consider separate divisions within the community, namely census tracts. Census tracts can often be conveniently defined and described on the basis of Bureau of Census data. Furthermore, these tracts have continuity in time, i.e., information collected in 1960 can be compared to that collected in 1970. Census tracts can be characterized to a certain extent by the construction of certain indices relating to place or person. Perhaps the best known is the socio-economic index which can serve as a base against which you can relate the distribution of say tuberculosis or other conditions which might have some association with poverty, affluence, stability of population, etc.

In conclusion, I believe that the epidemiological procedures as described provide a student with an insight into a practical and objective approach to the study of a number of environmental problems, and that in the final analysis the limitations to this approach are governed only by the initiative and imagination of the student. Furthermore, an exposure to this subject determines what a student would expect in terms of data base and objectivity for any environmental disease problem in his community. For the above reasons I believe that field epidemiology can make a valuable contribution to any general college course in environmental education.

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# COMMUNITY ENVIRONMENTAL MANAGEMENT: A COMMUNITY EDUCATION PROTOTYPE

by

Thomas A. MacCalla

The subject of our discussion is environmental education and our present concern is environmental education to improve the quality of life for all. For the purpose of this paper, however, the question of "Quality of Life for Whom?" should be rephrased to isolate the problem of who is out there in the community, or who are the interested and affected parties in the environmental process. In pragmatic terms the question could read, "Who does what to whom in a community and why and for what ends." Such restatement directs attention to the day to day problems of people and plans, the reactive posture of environmental problem-solving, and the potential of collaborative community efforts for gaining control over the shape and substance of human settlements.

It should be pointed out that the license taken in rephrasing the question is to provide a context for a collaborative approach to community environmental management. It is also designed to register a professional concern over the general apathy toward dealing systematically with environmental education in a multicultural environment and addressing the multidimensional needs for community betterment in culturally pluralistic society. In short, we are not only concerned with the question of who in the community decides what for whom and why, but also with the issue of establishing positive consumer-provider relationships for a socially supportive environment to ensure the shape and substance of environmental quality.

## Community Environmental Management

Community Environmental Management as a community education prototype comprises the activities of community participation in planning and decision-making. Thus, Community Environmental Management is an educational process for setting community goals and objectives, for managing social change through community research and information sharing. It begins with the identification and examination of pressing environmental issues, namely the phenomena of population increase and sector growth as it relates to land use and social planning.

Essentially, these were the major concerns of the Community Environmental Management Project just completed by the International Institute for Urban and Human Development. Translated in terms of a community education prototype, it defines the purpose of this paper: 1) to explain how the process of training through community research is an effective form of community education, and 2) to demonstrate how such a process can foster a socially supportive environment for community betterment through an holistic approach to community development.

The terms community environmental management and community education lend themselves to a variety of interpretations, but the cross-cultural Community

Environmental Management Project (C.E.M.) has specific meaning. Too often environmental concerns are limited to air and water quality, noise abatement, or open space conservation. Likewise, the notion of community education is viewed in the context of institutional programs for formal educational opportunities for interested adults in the local community.

The purpose of the C.E.M. project, however, was to broaden the understanding of the man-environment relationship by emphasizing the human dimension (cultural, psycho-social, socio-economic, and political factors) of environmental quality through community and agency based training and research programs.

During the past four years, the I.I.U.H.D., functioning through its former role as a University Center at United States International University, trained over forty graduate students in a practitioner-oriented degree program in Community Environmental Management. Essentially, the cross-cultural C.E.M. project represented a collaborative university-agency-regional community effort designed to create and field test, in conjunction with the communities of Escondido and Calexico, California, and Mexicali, Baja California, Mexico, a training prototype for practitioners in community development and environmental management. In addition, a university-based training model for use by other colleges, universities, agencies, and communities was developed to prepare, through applied community research, new professional careerists or generalists in Community Environmental Management. The training program was interdisciplinary and community-based. It focused on some of the behavioral, cultural, and socio-economic determiners of regional growth patterns in selected urban fringe and border communities.

The need to prepare such careerists and to mount new strategies for a better understanding of the interrelationship of knowledge and the interdependence of people for improved environmental quality is clearly evident. Decision makers and policy administrators must be made aware of the environmental health and of the social consequence of their actions. They must recognize the gap of understanding between providers and consumers in terms of comprehensive planning and the comprehension of such planning. They must also be made to realize that new institutional arrangements and strategies must be developed in conjunction with the community rather than for it. Equally important is the principle of participation of affected and interested parties and understanding the significance of an holistic and interdisciplinary approach to theory and practice within the context of collaborative efforts.

The C.E M. project stressed the need for general community improvements and increased understanding of the inter-cultural dynamics of a pluralistic society. It called for the development of new types of local and regional community leadership and the formulation of appropriate strategies to carry out community plans of action. In short, it demonstrated that training through community research is an effective form of community education.

The C.E.M. prototype is transportable and provides data and insights on cooperative community development planning and management. Once it is modified to meet the needs of a given regional community, it would facilitate the establishment of a community profile on the availability of

resources, consumption rates, human care services, the implications of technological advances, economic and political priorities, cross-cultural conflicts, and the range of tolerance for ecological balance and the limits of stress and social conflict. The process involved would underscore the value of shared decision making. It would encourage a re-examination of prevailing attitudes and priorities for development planning and promote a public forum for discussion of new institutional arrangements to meet stated objectives.

The Community Environmental Management Project emerged from a framework of national concern and federal action. There was a growing recognition that community environmental planning and management should focus on the multi-dimensional needs of multi-cultural environment. It recognized that people, where and how they live is crucial to the issue of environmental quality.

In 1971, the U. S. Department of Health, Education, and Welfare acknowledged the Institute's position that making a commitment to developing new structures and strategies alone was not sufficient. Of greater importance were the kinds of human resources required to insure that newer systems would function effectively. Practitioners needed to be developed who could work with the community at all levels and operate out of a holistic and integrated framework. Agencies needed to better understand the characteristics of modern man and his relationship to an increasingly urbanized environment. Institutions needed to re-examine their role and responsibility in terms of societal and organizational changes. Furthermore, these changes should be based on a definition of society as communities made up of diverse, socio-cultural and socio-economic populations who have basic needs and shared human concerns.

Similarly, consumers needed to recognize the role they have as a resource in the continuing development of the environmental planning and management process. As such, consumers also needed to re-examine their perception of the resources available to them through colleges and universities, service agencies and other professional groups. To insure relevance, all concerned need to participate in cooperative development planning activities to establish new structures and strategies.

The project involved the University through the International Institute for Urban and Human Development; the National Institute of Mental Health's Experimental and Special Training Programs, Center for Metropolitan Problems of the Division of Special Mental Health Programs; and the Bureau of Community Environmental Management, now an activity of the Center for Disease Control in Atlanta, Georgia.

The International Institute and the University recognized the need to develop new structures and strategies for providing a better understanding of the relationships among the physical and human environmental factors affecting health and well-being. Also, the need for a holistic and interdisciplinary approach to theory and practice within the cooperative efforts of institutions, agencies and consumers was an important task factor. Decision makers and policy makers must be made aware of the environmental health and human welfare consequence and to realize that new strategies and approaches must be developed in conjunction with the Community rather than for it.

Essentially, the C.E.M. Project was task oriented and designed to achieve the following objectives:

1. To study the effects of regional growth on environmental quality.
2. To identify some of the social and behavioral constraints in community development.
3. To identify alternatives for effective inter-ethnic and community education programs which influence public decisions.
4. To identify the effects of items 1 to 3 on the health and well-being of the community members.
5. To establish a resource center which would include a coordinated use of banked data for trainees and regional community development practitioners.
6. To make available to the participating communities and agencies pertinent information on the training and research activities.

Much of the training was based upon the concept of action-planning as defined by Holder and Deniston (1968) in their Public Health Service Report on a decision-making approach to comprehensive health planning:

> As planning is a process by which problems, objectives, and program activities are articulated, resources are allocated, and support is developed to implement agreed-on programs. Its outcome is action to implement the plans occurring from the process. Participants in the process learn by doing--by discovering and assimilating facts, by analyzing and interpreting them in the light of the community situation, and by democratically discussing and ultimately deciding what to do about the deficiencies discovered. The planning process is a way to integrate needs, as professionally defined, with demands, as defined by consumers of services, and to balance the various forces in the community into an integrated whole.

Speculative land developments, the attraction of new businesses and industry, accompanying population increases, vested local and large entrepreneural interests, socio-cultural conflicts, and relationship to regional developments were all factors which needed to be examined. A systematic study of these determiners and the identification of reasonable alternatives for desired social action was imperative.

Community Environmental Management served as a response to these pressures by maximizing the physical, biological, socio-cultural and psychological qualities of a community through the most effective utilization of human and material resources. Thus, Community Environmental Management is a process for managing social change through community research and information sharing. The model for such a process illustrated in the accompanying diagram is based on the goals and purposes of the C.E.M. Project prototype and incorporate the dimension of training practitioners through research in community environmental management and the dimension of community education and information systems research.

Community Education Prototype: A Rationale

In terms of community education, our major concern is with promoting community support for the process of planned change in human settlements. It is important that people acquire a sense of purpose in communities and gather data about the "objective" or outside "images" of their living space and life styles, population characteristics, economic base, educational system, political patterns, religions, associations, health and transportation systems. Moreover, it is important that decision makers and the lay public recognize that certain kinds of information should be gathered in communities prior to planning for action programs and projects.

As my colleague John D. Donoghue points out in his continuing application of anthropological principles to the process of community development, each community differs in some respects from every other community. Therefore, a researcher cannot assume that general patterns that characterize a county, state, or region hold for a particular village, town, or city.

The rationale used for characterizing a community was based upon the notion of an holistic approach to community identity. As such, the systems derived by Donoghue (1975:11) from the "functional prerequisites" for continuous social life described by Bennett and Tumin (1948) account for the major components of a community profile.

| Functional Prerequisites (adapted from Bennett and Tumin) | System |
|---|---|
| 1. Biological reproduction. . . . . | .Kinship |
| 2. Socialization of new members . . . . | .Education |
| 3. Production and distribution of goods and services. . . . . | .Economics |
| 4. Maintenance of internal and external social order. . . . . | .Politics |
| 5. Maintenance of meaning and motivation . . . . . | .Religion and Recreation |
| 6. Maintenance of biological functioning. . . . . | .Health |

Donoghue's translation of these functional prerequisites also includes two additional components: Associations and Transportation. The former is a catch-all category which includes peer groups, clubs, and other community organizations; the latter emphasizes the importance of linkages within and amongst their populations. Taken as a whole the system is referred to as KEEPRAHT and becomes a tool for viewing the human (structures, facilities and technology, population, institutions, etc.), man-made and natural (air, land, water, etc.) components of a community. The bits and sum of information gathered about any given community is then categorized and matrixed to determine interrelationships and implications of these relationships to providers and consumers.

In short, the community itself can be thought of as a part of a larger system, a human settlement whose life and effectiveness as a community is determined by the flow of goods and services, the linkages and constraints which enhance

or inhibit that flow and the control points at which materials, energy, people, and information are obtained, prepared, and allocated under the supervision of "control people" for their eventual use.

Equally important is the role of images people have about themselves and their surroundings; as Boulding (1956) points out an image is the perception people have of the world in which they live and conceptually order their experience.

> People have images about other people, stemming from their relationsips in kinsmen, friends, and other community members in general, as well as with outsiders; in short, they form images about the human component of the community and its extensions. People also have images of the natural and man-made components, and the uses which can or should be made of them. These resource or initial images all fit together into a "holistic" conception of the environment. (Donoghue, 1975:17)

Similarly, as Donoghue (1975:18) stated:

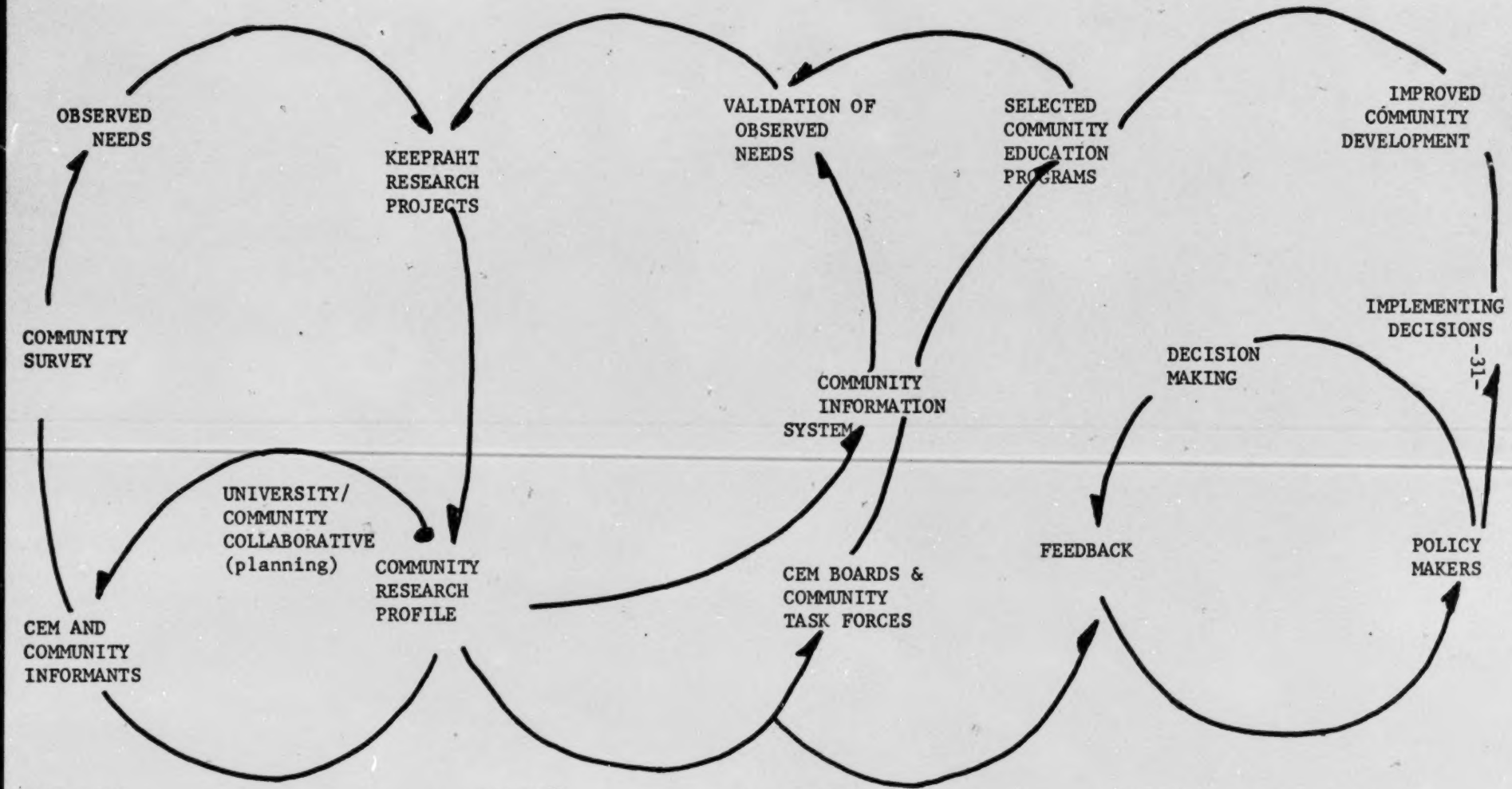
> People's actions are based upon their images and plans; thus, the community development effort is often directed toward changing images and plans so that behavioral changes also occur. Community change takes place only when changes in people's activities do occur. Identification of images, then, is central to the process. Images are changed as a result of education, i.e. new information and experience and their reformulation.

Community education as a by-product of training through community research is most effective when the community is viewed as a whole and its parts and their interrelationships are determined through team or collaborative efforts. The accompanying diagram on community education and the research process model, illustrates the amorphous nature of community education and the synergistic flow of events which produce consensus for formulating and carrying out plans of action.

Just as we begin in the middle of all process models, we start here with the Community Environmental Management Prototype. As previously noted, the design of that action-planning training model is to marshall community resources and enable a community to identify itself and plan accordingly. In most instances communities build plans and limit themselves to the reactive make-up of those plans instead of planning for eventualities. Such planning is provocative and seen as a luxury rather than the necessity it proves to be. The C.E.M. research process provides a community with this "luxury" and ensures both a framework for shared decision-making and a basis for consumer receptivity and support.

The observations made by the community researchers are based upon perceived needs and identified systematically through the use of participant observer techniques and the KEEPRAHT system of analysis. A community profile of validated information is then produced with ready access to the informa-

COMMUNITY EDUCATION AND RESEARCH
PROCESS MODEL




**PHASE I**
Planning, Initial Data Collection, Image & Needs Assessments

**PHASE II**
Data Collection/Validation & Community Profile and Information System Modelling

**PHASE III**
Analysis & Synthesis, Community Education Programs (field testing)

**PHASE IV**
Evaluation, Community Education and Community Action (Documentation)

tion gathered by the community participants. The information is coordinated to establish a network for communicating priority concerns and available options to the various publics. Tentative decisions begin to form and are rounded out with feedback. The multilevel involvement of policy-makers, policy administrators and the interested and affected consumers then ensure the chances of concerted community action for improved community development.

As previously stated the purpose of this paper was to explain the process of community environmental management as an approach to community education and to demonstrate through an explication of a theoretical framework how such a process can foster a quality of life environment in a regional community.

In summary, may I state that the interaction process of training through community research was our most important product. Community environmental management as a community education prototype focused on the people of the community. It concentrated on the few people who set policy and made the final decisions, the minority influentials whose opinions shape community opinion, and the majority whose lives are affected by a process in which their participation seldom goes beyond the ballot box.

The lesson learned was that through the collaborative, holistic approach to planning and managing the environmental context for community living, people become members of a learning community where self-study through action-planning becomes a shared expectation. Understanding and capitalizing on the creative tension which emerges in the process sheds new light on ways to solve common problems. Promoting task-oriented educational activities in which community leaders are links in an information network to increase the probability that the information gathered and the cumulative effect of related community research becomes the hallmark of community environmental management.

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# THE QUALITY OF LIFE

by

Dr. Harold J. McKenna

The following model is designed to illustrate to students the concept of a value as being either personal and/or societal in nature, and that choices made to enhance the quality of life are dependent on the values of an individual, even though sometimes one's personal values and those of society may be mutually exclusive.

PERFORMANCE OBJECTIVES:
After investigating the case studies on value judging, students should be able to:

1. Identify the value underlying the choice made in certain hypothetical cases; and
2. Distinguish between personal values, societal values and those values which are mutually exclusive.

PREASSESSMENT:
This lesson investigates the values of life through a case study approach. Unlike other models, this one gives students an opportunity to hypothesize on a situation, and make value judgments that are basic to his survival as well as that of societies. Two case studies are presented in this model: one deals with a rocket and its forced landing on an unknown planet; the second one deals with the planet management from the surviving crew. Before the exercise begins students are only required to be somewhat familiar with role playing.

TEACHING STRATEGIES:
Basically, this lesson involves handing out student worksheets to be completed individually, and then discussed as a class.

1. Hand out worksheet #1, and read it over with the class. Be sure that the students know what they are to do.
2. When they have completed the first worksheet, repeat the procedure with worksheet #2.
3. After completing worksheet #2, ask several students to put their list of ten people on the board. Ask them to explain reasons for some of their choices. Ask why they left out some of the other people. The list includes people that seem to represent different values.
   a. Do the students lean heavily toward one group?
   b. Is a balance between groups met?
   Discuss the various people on the list and reasons for choosing each.
4. From the list of people on worksheet #1, categorize and discuss each according to the following values: a) immediate survival; b) long-term survival; c) culture and aesthetics; d) leadership and organization; e) sexuality; f) family and friendships; g) chivalry.

5. After discussing the various values and grouping, have other students show on the chalkboard their ranking of the items on worksheet #2. These items fall into four major classes: short-term survival; long-term survival; pleasure and entertainment; and items valuable to society. Decide if each student favors one type or another, or if he strikes a balance. Ask students to give reasons for their choices. Point out to the class that their choices express a hierarchy of value in a stress situation.

It is suggested at this time to spend at least two teaching periods on this model. Use worksheets #1 and #2 during one or two periods, and develop "planet management" at another period.

6. After completing steps 1-5, you are now ready to role play with your class. Prepare ahead of time cards having the identity of a survivor printed on one side, and basic arguments on the other side. Match these identities with the list of survivors found on worksheet #1. You are permitted to create as many children and engineers as are necessary to allow each student in the class to play some role or another. At worst, leave some of the roles out of the play if you do not have the number of students needed.
7. The class should select a leader to moderate the dispute. Whom they choose might be the basis for some discussion. Do they choose a popular member of the class without regard to the role that person is playing? Do they choose a survivor whose role implies the ability to be a leader? The leader's job will be to call on others, who may have questions. He may want to pick two assistants whose function would be to summarize the arguments and help count the votes of the remainder of the class.
8. After each case, discuss what values were favored: personal; societal; or a combination? Two of the many values that can be considered are a) satisfying biological needs, and b) cooperation for the good of the group. Be sure you have the class suggest alternatives for settling some of the problems that arise.
9. Each identity card should have a corresponding set of basic arguments that the individual must present when his case comes up or when he argues against one of the others. It is suggested that students prepare such arguments as a homework assignment, and then bring them to class for the presentation.
10. To stimulate interest in this role playing exercise, read the following introduction:

    Upon crash landing of the rocketship on Environplanet, a portion of the crew has survived. After exploring the planet, the crew has concluded that it will be possible to live there for some time, if necessary. Nevertheless, life is difficult on the planet and enough food for everyone is hard to find. It takes most of the day to gather enough food for everyone. Every evening, soon after dark, it rains for about four hours, and the temperature drops about 40 degrees. There seems to be little hope of rescue since all communications have been lost. The people are becoming more irritable and frustrated as weeks go by. Many disputes have been arising among the crew. They decide to hold a court to settle the disputes for the general welfare of the community. Today we will role-play this court situation.

POSTASSESSMENT:
The comparison of values in both worksheets #1 and #2, and the role playing will provide evidence you need to assess the attainment of the objectives. No formal testing is necessary. Students might make comparative investigations using the planet "earth" and the present-day situation of our environmental degradation. In this way, you can see if their values change or whether or not they see our present environmental crisis in the same light of that of SURVIVAL!

WORKSHEET #1

NAME_____ CLASS_____

DATE_____ TEACHER_____

A CASE STUDY ANALYSIS: A CRASH LANDING.

You are on a rocketship flight with a large crew of people from all walks of life, heading toward the moon. Suddenly a fuel leak causes the rocket to go out of control. The computer, which is navigating the ship, flashes an emergency signal for a crash landing. The entire crew prepares for the crash. No one knows where they will eventually land.

1. Here is a list of some of the people aboard the ship with you. Whom would you prefer to survive, to insure your survival of the hardships ahead? Indicate your choices, and rank them in order of preference from 1-10. (Assume that only 10 will survive the crash landing.)

| | | |
|---|---|---|
| A Botanist ..... | A Lawyer ..... | Women & Children ..... |
| A Zoologist ..... | A Sexy Model ..... | An Engineer ..... |
| A Geologist ..... | An Artist ..... | A Computer Expert ..... |
| An Astronomer ..... | A Priest ..... | An Actor ..... |
| A Wrestler ..... | Your Brother ..... | An Author ..... |
| A Physician ..... | A 4-Star General ..... | Your Sister ..... |
| Your Father ..... | A Pianist ..... | Your Best Friend ..... |
| Your Mother ..... | A Farmer ..... | A Carpenter ..... |
| A Handicapped (phy.) ..... | An Inventor ..... | A Hunter ..... |

WORKSHEET #2

NAME_____ CLASS_____

DATE_____ TEACHER_____

A CASE STUDY ANALYSIS:

1. Using the case in Worksheet #1, we find that in addition to people needed for survival, we also need some items that were taken on the trip. Rank in order of preference what you would consider the most important for your survival.

Pots and Pans .....
Portable TV .....
Clothing .....
Musical Instruments .....
A Transistor Radio .....
A Bible .....
Fishing Tackle .....
A Hunting Knife .....
A Rifle & Shells .....
A Deck of Playing Cards .....
Ten Bags of Pretzels .....
Chess Set .....
100 Cartons of Cigarettes .....
A Book on Survival .....
A Mink Coat .....
Stocks and Bonds .....
Money and Jewelery .....
An Electric Saw .....
Museum Painting .....
Crucifix .....
Cigarette Lighter .....
Flashlight & Batteries .....
A Book of Matches .....
Vegetable Seeds .....
Rope and String .....
Ten Chickens & Two Roosters .....
A Pair of Cows & a Bull .....
A Case of Canned Food .....
A Case of Beer .....

# INSTRUCTIONAL SYSTEMS DEVELOPMENT FOR COMPETENCY-BASED POSTSECONDARY ENVIRONMENTAL HEALTH EDUCATION

by
Paul R. Mehne

The purpose of this paper is to discuss the instructional development process employed in conversion of a multidisciplinary, university environmental health program (fully accredited by the National Environmental Health Association) from a traditional frame to a competency-based, performance-oriented format.

Our effort to accomplish such curriculum design represents a division level effort to provide instruction which: (1) specifies for faculty and students a domain of competencies that clearly define pertinent intellectual skills; (2) specifies for students exactly what competencies must be acquired respective to each level of the environmental health curriculum (providing regular and periodic feedback); and (3) allows faculty to be more directive in their instruction, and attentive to individual, cultural and educational differences. For students with such differential entry-level competence, this approach provides prescriptive instruction that presents absolutely succinct, terse verbal communication--avoiding idiom and modifiers attendant only to one cultural group or another. This approach further focuses, from a language standpoint, on instructional communications that look beyond normal considerations of syntactics (relations of signs to signs) and semantics (relations of signs to their meanings) to considerations for relations of signs to the people who use them. I point these considerations out to amplify the learner-centered focus that our design of competency-based environmental health instruction is taking.

## What is Competency-Based Education?

Before reviewing the technology associated with accomplishing design of competency-based instruction, it is important to define the construct. A competency approach to instruction involves moving from identification of professional competencies to precise behavioral objectives. We are then concerned with instruction that attends to maximizing student learning through: prespecified objectives; specialized techniques of assessing student performance; prescriptive instruction based upon differential mastery of those objectives; and instructional design responsive to demonstrated performance of competent professionals.

In addition to the intuitive perceptions of an instructor, or department of instructors, this approach also seeks to characterize optimal professional performance to determine competencies to be manifested by students. This first requires identification of what a competent entry-level professional is--how he is adequate for a particular purpose. The requisite competence for professional performance then dictates program and evaluation design.

Evaluative, diagnostic activities in the competency-based approach specifically: (1) offer encouragement for progress made in each level of a curriculum; (2) amplify what profession-pertinent competencies have been acquired; (3) identify competencies that will be built upon this acquired "competency base", and (4) demonstrate how these competencies will be important, in a larger sense, to development and performance of a functional professional.

As such, the competency-based approach (and concomitant diagnostic procedures) will reduce instructional system susceptibility to misinterpretation or confusion, by students from differing cultural backgrounds; while it offers opportunities for reinforcement to all students at frequent, regular, successive stages of the curriculum. Students participate in management of instructional activity: helping identify congruence between demonstrated performance and competency standards. Consequently, student evaluation serves as an integral instructional activity, rather than simply some normative instrument to discriminate among students.

I have specified a number of positive attributes of competency-based instruction. But, before approaching the design process, it is important to describe pitfalls of this instructional frame. First, faculty workshops should precede design of competency-based instruction to preclude any confusion that might emanate from the approach's new vocabulary and conceptual schemata. Second, these workshops should provide specific orientation to prevent thinking of courses simply as curriculum units to be filled with topic relevant content. Third, "buffer activities" must be included in courses that will interface with traditional curricula. These buffer activities serve as advance organizers (Ausubel, 1967), preparing the student for both the information and the instructional activities he may expect in subsequent traditional courses. By specifying how new material may integrate with competency specific instruction, buffer activities facilitate student transition to traditional instructional frame. With positive characteristics and possible pitfalls identified, we can now turn to accomplishing design of competency-based instruction.

Determine Pertinent Competencies and Behavioral Objectives

The emphasis is upon the first two phases of designing competency-based instruction: (1) Determining pertinent competencies and behavioral objectives, and (2) sequencing instructional activities (see Figure 1). It is these activities that most dramatically discriminate between competency-based instruction and traditional, flexible credit, or flexible time, instruction. The other phases in this process (Design Evaluation Procedures and Instrumentation, Acquire and Produce Instructional Materials, and Field Test, Evaluate and Revise Instructional Sequences) will only be briefly discussed below. For detailed discussion of these three phases, I would suggest treatments found in Diamond et al. (1975) and Gagne' and Briggs (1974).

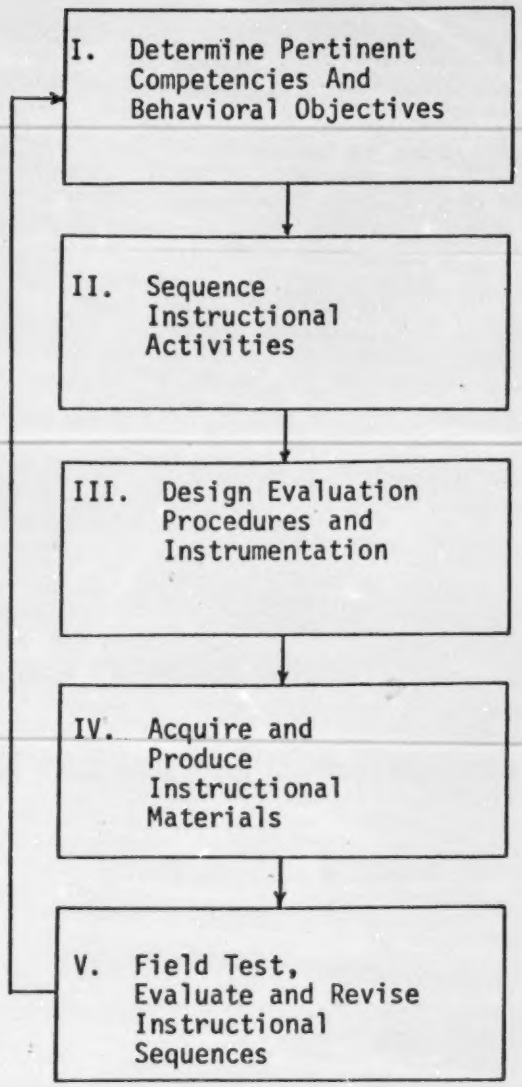
FIGURE 1

INSTRUCTIONAL DEVELOPMENT PROCESS MODEL

(following page)

FIGURE 1

INSTRUCTIONAL DEVELOPMENT PROCESS MODEL


I. Determine Pertinent Competencies And Behavioral Objectives
II. Sequence Instructional Activities
III. Design Evaluation Procedures and Instrumentation
IV. Acquire and Produce Instructional Materials
V. Field Test, Evaluate and Revise Instructional Sequences

In the first phase of competency-based instructional design, the development team: delineates programmatic goals, defines roles and functions of optimal professional performance; specifies student terminal competencies; specifies enabling competencies that contribute to terminal competencies, specifies performance objectives attendant to enabling and terminal competencies; specifies the classification of internal and external conditions essential to the design of instruction with maximum efficiency; and lists prerequisite, entry-level competencies. Chronologically, this activity involves: (1) specification of pertinent terminal competencies; (2) identification of subordinate, enabling competencies and prerequisite entry-level competencies; and (3) specification of detailed, behavioral objectives and their interaction. To clarify outcomes of each activity in this phase of the instructional development process, it will be helpful to discuss how an Environmental Health Terminal Competency is elaborated.

The development team (including all department faculty and an education specialist) initially identified a partial list of topical areas that comprise the curriculum: planning environmental health programs, solid waste management, waste water management, water quality management, food sanitation, occupational health, public health administration, air pollution, accident prevention, impact analysis, housing and health, institutional environment, radiation and health, noise control, insect and rodent control. Each of these topical areas was subsequently assessed to articulate pertinent competencies. The second step involved developing an analytical strategy with which the functioning professional accesses information acquired during academic preparation. That is, how does the professional perform his daily function after leaving the academic environment?

For the environmental health curriculum, we are generally speaking about a systems approach composed of the following activities:

1. Identify professional systems problems
2. Procure needed information about problems
3. Develop solution alternatives
4. Select solution strategies and tools
5. Acquire relevant resources
6. Implement solutions
7. Evaluate effectiveness of implemented solutions
8. Prescribe revision

This analytical model serves a dual function. It prepares students for performance during internship activity. It also provides students with some focal point with which they can associate every component of curriculum specific instruction.

The third step requires the identification of components within the environmental health competency network. This network constitutes knowledge, skills, and attitudes developed as entry-level, enabling, and terminal competencies in environmental health education programs.

The professional competency network was viewed as an interconnected series of input (I), instructional process (P), and output (O) entities (see Figure 2). Such a perspective permitted the faculty and instructional developer to conceptualize relationships among entry-level competencies and enabling competencies as they contributed to terminal competencies. With respect to these system entities, the output (O) of activity that permits the student to acquire an enabling competency contributes as the resource input (I) for a terminal competency. Diagrammatically, the educational design activity at this level involves faculty and

instructional developer moving from identification of terminal competencies through a broadening base of enabling competencies to a prescriptive list of prerequisite, entry-level competencies.

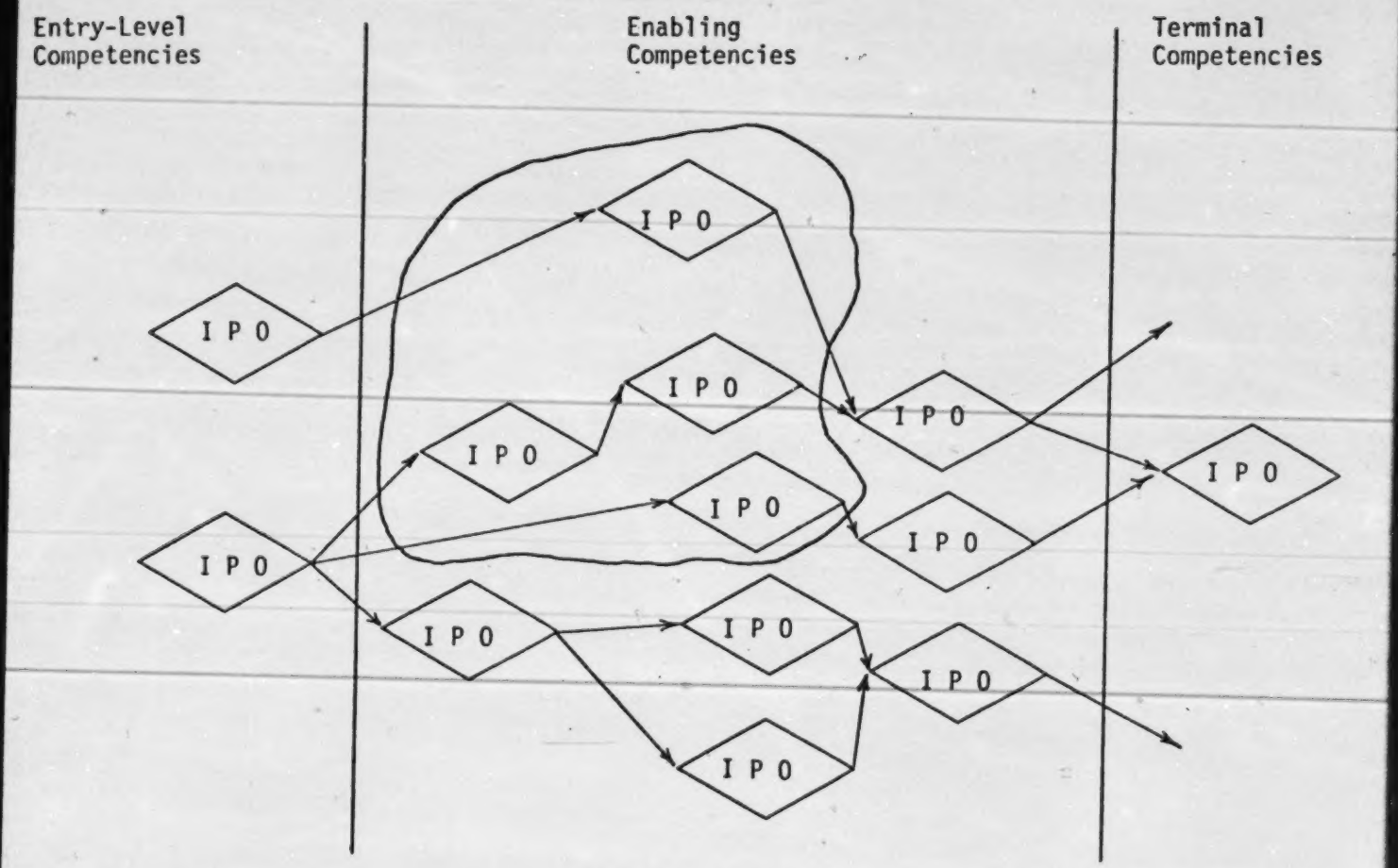
FIGURE 2

PROFESSIONAL COMPETENCY NETWORK

(following page)

FIGURE 2

PROFESSIONAL COMPETENCY NETWORK



Once the competency network entities have been identified regarding input-output relationships, the faculty and instructional developer: (1) articulate pertinent performance objectives (affective, cognitive, and psychomotor) for each competency in the network and (2) identify the instructional processes (P) that comprise internal and external conditions essential to the design of instructional activity specific to each competency.

At this point, competencies are also analyzed in terms of their "clustering together". In Figure 2, the four encircled competency entities may consist of related content. Therefore, they may reinforce each other in presentation of instruction, and indicate appropriate clustering within the same instructional module, or course.

Explicit detailing of both the competency network and analytical strategy further allow student simulation of actual professional performance. Confronted with a problem, or goal, the student can utilize the environmental health analytical strategy to "pull" pertinent competencies from the network--in much the same way we would tease a thread from a piece of clothing. In so doing, all interconnections (relationships) between this "proposed solution alternative" and related alternatives would be identified. This vehicle provides students with actual practice in: (1) identifying possible solution alternatives, (2) selection of solution strategies and tools, and (3) planning and implementing of contingency actions should the selected strategy fail.

Sequence Instructional Activities

After assembling the professional competency network and analytical strategy, the environmental health faculty and instructional developer evaluate appropriateness of competencies and associated objectives identified in the first phase. This activity will continue indefinitely as a monitor of the dynamic Environmental Health Professional Competency Network.

This activity is accompanied by a categorizing of competencies within the following classes: (1) role characteristics (related to defining professional roles); (2) functional topics (related to theory and tools required for effective performance); (3) application topics (related to understanding the functions, organization, and social system characteristics of the service in which the graduate will work); (4) integration and relevancy topics (related to demonstrating relationships between roles, theory and tools and their application to specific, prevalent problems in the professional's work); (5) occupational interaction topics (related to interaction of the professional with his colleagues and organizational environment); (6) task topics (related to the technology that enables implementation of the analytical strategy) and (7) self-evaluation topics (related to evaluation of professional growth needs and design of strategies to meet those needs) (adapted from Rowse et al., 1975). The process of categorizing competencies in classes assists our movement from competency to behavioral objective by maintaining and amplifying pertinent interactions. Such a process also reduces possible confusion by postponing consideration of psychological theory aspects of the learning relationship until the development team is prepared to identify relevant instructional activities. With competencies evaluated and classified, the development team begins analysis of learning tasks appropriate for each competency. The purpose of such analysis is the preparation of preliminary instructional sequences that represent "ideal" organization of instructional activities in the Environmental Health curriculum. The expected outcome is the design of learning tasks that maximize student acquisition of program instruction. This analysis also: (1) enhances identification of true interrelationships among

instructional components; (2) allows subsequent, systematic application of learning theory to identify how these components should logically occur in presentation of instruction; and (3) arrays instructional elements in proper time frame.

The final activity in this sequencing phase involves the development team modifying the idealized sequencing of instructional activities to reflect practical constraints and feasibilities of the instructional environment. The team also identifies competency network "nodal points" where diagnosed, differential entry-level to programs may occur.

I believe it would now be helpful to review an example of this process (see Figure 3).

FIGURE 3

ENVIRONMENTAL HEALTH COMPETENCY EXAMPLE

(following page)

FIGURE 3

ENVIRONMENTAL HEALTH COMPETENCY EXAMPLE

TOPICAL AREA: AIR QUALITY MANAGEMENT--environmental aspects of life-style and their affects on disease processes/health problems.

PROFESSIONAL RESPONSIBILITY: Identify behaviors implicated in the etiology of specific health problems.

PROFESSIONAL COMPETENCY: When confronted with a population of high risk patients (e.g. pregnant mothers and infants) that present nonspecific symptoms of headache, dizziness, nausea, and lethargy, the environmental health specialist conducts field surveys and computes demographic statistics concerning the presence and atmospheric concentrations of carbon monoxide in living environments.

STUDENT TERMINAL COMPETENCY: When presented with county health department information that non specific symptoms of headache, dizziness, nausea, and lethargy are reported for pregnant mothers and infants living in homes with wood stoves or gasoline heaters, students will:
(1) design appropriate instrumentation;
(2) conduct a field study of the population, and
(3) compute demographic statistics concerning presence and differential levels of carbon monoxide in population living environments.

Instructional Activities: In groups of four have students conduct field study in 20 target population homes (specified by the instructor with assistance from a county public health nurse) Multiple data will be collected for presence of CO, and levels of CO in various locations within each living environment. Students will interview mothers to collect data concerning the duration of daily domicile occupancy for each family member. Audio tape record each interview and on replay, have other students give feedback prior to instructor review of interview process.

Individually, have students determine pertinent demographic statistics; compute those statistics for the data collected, and file a technical paper to report interpretation of statistics and recommendations for appropriate action. Discuss instructor evaluation and grading of reports.

ENABLING COMPETENCY: Given carbon monoxide detectors and a Bendix/Gastec precision gas detector, students will collect data on presence and concentration of carbon monoxide.

Instructional Activities: Have individual students use carbon monoxide detectors and a Bendix/Gastec precision gas detector to sample air quality of laboratory chambers containing differential levels of carbon monoxide. Discuss instructor evaluation of student measurements for carbon monoxide presence and levels.

ENABLING COMPETENCY: Given a prepared instrument, and a "primed client", the student will interview the client while meeting criteria for: appearance and demeanor, serving a neutral role, familiarity with questionnaire, following question wording exactly, recording responses exactly, and probing for responses.

Instructional Activities: Students will observe the instructor interviewing a "primed client" on video tape, while reviewing an evaluative check list of performance criteria.

Students will then interview a "primed client" using the prepared instrument and be recorded on video tape. Video tapes will be subsequently reviewed by the class (giving feedback) before the instructor discusses performance evaluation.

ENABLING COMPETENCY: When given a written patient scenario that reports carbon monoxide poisioning, students will describe the effects of acute and chronic carbon monoxide poisoning.

Instructional Activities: Have students read handout describing the pathogenesis of carbon monoxide injury (including formation of carboxyhemoglobin) and acute & chronic poisoning syndromes. Review handout stressing dangers of functional anemia.

ENABLING COMPETENCY: When given an air quality report indicating high atmospheric carbon monoxide levels, students will describe causes for elevated CO levels.

Instructional Activities: Have students view prepared video tape discussing how incomplete combustion of fossil fuels effects carbon monoxide levels from various stationary and mobile sources.

From the topical area, Air Quality Management, faculty focused upon the professional responsibility: Identify behaviors implicated in the etiology of specific health problems. The development team next identified a pertinent professional competency that enabled the environmental health specialist to conduct field surveys and compute demographic statistics. Such competency then prescribes that students should graduate from the academic program with this ability (i.e., terminal competency). Realizing that it is not possible to duplicate exactly the professional competency in the academic environment, the development team prepared a student terminal competency that: (1) approximates professional function at the highest possible level of simulation, (2) reflects real professional system problems (in this case: carbon monoxide poisoning from wood stoves and gasoline heaters), and (3) allows students to utilize, and therefore reinforce, previously acquired knowledge (in Figure 3: pathogenesis of carbon monoxide injury). Two instructional activities were selected to attend to the Figure 3 student terminal competency which allowed student practice at very high levels of simulation and gave immediate feedback concerning the degree to which students acquired the specified competency.

The development team next addressed the question: What competencies must students possess before they can acquire the student terminal competency? Four enabling competencies were identified that prepared students to: (1) collect data on the presence and concentration of carbon monoxide; (2) interview clients; (3) describe the effects of acute and chronic carbon monoxide poisoning; and (4) describe causes of elevated carbon monoxide levels. Instructional activities selected for enabling competencies were designed to provide practice and feedback, transmit information, shape attitudes, and provide a frame of reference.

The process described with respect to the Figure 3 example takes place with each component of the professional competency network during the sequencing phase.

Design Evaluation Procedures and Instrumentations

Briefly, this component of the instructional development process involves the development team preparing instrumentation for the assessment of: (1) student behaviors that indicate acquired competencies, (2) what revisions in curriculum design and organization are indicated, and (3) the degree to which the total curriculum is achieving its identified objectives.

With respect to student performance, evaluation focus moves from considerations of evaluation methodology (e.g., assessment of individual tasks, transitions between tasks, and cumulative learning experience) to standards of student performance (i.e., what should the student be able to do? How well? When?). The development team uses the Environmental Health Professional Competency Network in answering these questions. Chronologically, they develop methodology, techniques, and standards for evaluation of: (1) each terminal competency (and associated objectives), (2) each enabling competency, and (3) each entry level competency.

The special focus of all evaluation activity in this approach is upon assessment of student behaviors to determine discrepancies between the behaviors and performance standards. These discrepancies, then, indicate prescriptions for revision or refinement of instruction--reinforcing acquisition of competency specific behavior, prescribing individual activity when standards are not met, and indicating revision of instructional programs to insure meeting those standards in the future.

Acquire and Produce Instructional Materials

During this phase, the development team reviews all currently available instructional materials and methodologies to select materials and instructional techniques which best satisfy identified behavioral objectives. The instructional developer provides consultative and supervisory input with respect to suitability of instructional media and prescriptions for instructional activity. Faculty provide input concerning accuracy, quality, and utility of information presented in selected, alternative materials and strategies.

After alternative materials and strategies have been selected by the development team, a careful review of each alternative is conducted. Acceptance criteria for utilization of a particular available alternative include: (1) identification of the type of learning involved for the competency-pertinent instruction; (2) the amount of guidance desired; (3) congruence with the curriculum's competency-based instructional management approach; (4) ability to address the specific characteristics of the student population; and (5) congruence with the time line established while sequencing of instructional activities occurred.

In the event that new instructional materials must be produced, the development team will: (1) prepare a preliminary draft of the instructional component (based upon entry-level skills, student response requirements, stimulus requirements, and performance criteria); (2) revise the preliminary draft; (3) select an appropriate media form; (4) arrange for production services; and (4) produce distributable copies of the instructional component.

Field Test, Evaluate, and Revise Instructional Sequences

Activity in this phase begins with logistical planning to coordinate the presentation and evaluation of field test instruction. This activity also requires orientation seminars for students and staff to deal with transition from traditional instruction to competency-based instruction,

After initial instructional component trials, the development team assesses congruence between student performance and criterion standards. As a consequent they will recommend alternative instructional strategies to ineffectual instructional components.

This final phase of the competency-based development process begins a continuing, and cyclical, renewal process that constantly improves instructional activity attending to student's individual differences, and reflects changes in the Environmental Health domain of knowledge and professional competency network (Figure 2). Such renewal activity will also modify differential program entry-level requirements in response to changes in experiential competencies acquired by students from non-traditional educational environments, or work environments.

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# ALTERNATIVE ENERGY APPLICATIONS

by
Terry C. Nunneley
Margot M. Nunneley

We feel alternative energy plays an important role in the Elementary Curriculum of Environmental Education. With today's ever increasing shortages of our fossil fuels, we believe it is imperative that our children become aware of alternate energy sources and ways they can implement their use.

One energy source easily demonstrated in the classroom is that of solar energy. An exciting and easily constructed learning tool is the solar oven. This device can be constructed in the classroom and when completed, demonstrated outdoors. In our learning experience, we discussed the effect of the reflectors and then observed the temperature variations as the reflectors were moved at different angles. After the discussion, we enjoyed watching solar energy at work, baking us a cake. For the students it was interesting, amazing, unbelievable, and fun, learning about solar energy.

Another demonstration in solar energy is that of a parabolic cooker or reflector cooker. This is a simple umbrella shaped device lined with aluminum foil. It is made from cardboard boxes, poster board, glue, and aluminum foil. This can also be constructed in the classroom. When it is pointed at the sun, the sun's rays are concentrated at a certain point, and it is easy to cook at this focal point. The students helped in building this parabolic cardboard reflector, and when it was completed, we discussed the geometry associated with the parabolic curves, the application of optics, and the solar energy involved in its use. After the discussion, we picked a nice sunny day, took our reflector cooker outdoors, stood around the cooker and roasted hot dogs and marshmallows. We turned our solar energy experience into a picnic. These two demonstrations were utilized in a fourth grade classroom; however, with the geometry and optics involved, it could be taught at higher levels with a more sophisticated approach utilized.

Another device that can be used in the classroom is the solar collector or absorber. This is a large enclosed device used to heat water. This could be built in a high school or junior high school metal shop, and when completed, experiments in science classes at all levels could be achieved. Lessons in collecting and compiling data can be taught as temperatures are attained from varying weather conditions.

Included in our list of alternate energy teaching aids are two devices near completion. These are a wind-powered washing machine and a peddle-powered television. The wind-powered washing machine is a simple machine which operates similar to the camshaft and piston in a car; the piston being the plunger in half of a fifty-gallon drum. As the wind blows, the windmill causes the plunger to agitate the clothes. The peddle-powered television is another classroom experience. A black and white television is hooked up to a bicycle that is connected to a car generator, a 12-volt battery, and an inverter.

As the student peddles the bike, he generates enough energy to watch television.

With the construction and use of these instruments in the classroom, the student not only learns about alternate energy sources, but also broadens his knowledge in other subject areas.

# ESSENTIALS FOR THE ENVIRONMENTAL EDUCATION CURRICULUM

by

Dr. Robert A. Pedigo

The 1976 NAEE Conference focused on "New Values for a New Century." In my mind, there are two ways to approach the teaching of values. One is to approach it purely from a philosophical point of view, and the second is to approach it from the pragmatic point of view. With respect to environmental education, the pragmatic approach is a discussion of the principles in environmental management that cause environmental use and misuse to be value laden.

In determining what principles might be involved in a model or standard curriculum in environmental education, it might be well to look very briefly at the history of our nation's approach to the solution of similar problems Early colonists established universities near the end of the 17th century because of the clear recognition that professionals in medicine, law, teaching, and theology had to be trained in local institutions. As the conservation movement began to take shape in the late 18th and early 19th centuries, conservation became an important part of the public education curriculum. And finally, the problems of soil erosion and food production resulted in the establishment of the Land Grant University Legislation. In each instance, the public had observed current problems, and looked to their elected representatives to provide the legislation necessary to implement educational systems that could provide the training necessary to solve the problems of concern.

In the last fifty years, our nation has been transformed from an agrarian to an urban society. The large percentage of Americans no longer have the close association with the land demanded by agrarian life. At the same time, the industrial revolution and the advance of the technological age had made it possible for us to modify the natural environment on an immense scale. The results have been an obvious degradation of environment in the growing symptoms of industrial pollution, energy shortages, increased cost of food, flooding, etc.

Since most of the population has lost a close association with the land through agriculture, it is important to realize that environmental education must now fulfill a need that has only recently developed. In view of the fact that we have, over the past three decades, developed a keen understanding of the functioning of natural systems through the research conducted in the science of ecology, we must also realize that environmental education must be substantially more sophisticated than the knowledge of agriculture that has provided us with a land ethic until recently. Environmental education ought to be an educational process in which awareness, appreciation, and understanding of the essential life-supporting functions of natural living systems is created with the expectation of behavioral modification. Behavioral modi-

fication is the goal of all educational processes, and in this case, the desired modification is to a behavioral pattern based on stewardship rather than exploitation of the natural environment. The attitude of stewardship must be supplemented with an attitude of conservation that recognizes that wise use of our natural resources is essential to maintaining the quality of life that we have all come to expect.

The environmental movement has taken deep roots in the minds of the general public in our country. Although it is currently in vogue to debate how permanent environmental concern will be, most knowledgeable people in the field recognize that environmental problems are certain to get worse rather than better in the near future. As individual examples of increasing environmental deterioration are brought before the public through the media, the current interest in environmental problems will be maintained.

In spite of the public's interest in environmental problems and its concern for correcting these problems, environmental education programs seem to be floundering around the country. Although a relatively large number of states have contemplated environmental education programs, many of these are indecisive programs, and even fewer programs have been implemented. Even the best of the planned environmental education programs are plagued with poor or partial implementation. The public is demanding a meaningful environmental education program so that the current generation's children will not be faced with as many of the same problems as have created economic and social disruption in the past ten years.

While it is true that inaction and lack of funds at the federal level have caused a serious problem, I think that it is also true that environmental educators have been guilty of clouding the issues. Many people in the field have been more concerned with the academic principles involved than the solution of problems in which society is interested. The public has a right to expect leaders in the field of environment and education to "get on with it" and cease hindering implementation because of politics, competition for funding and inaction due to the trivial arguments over educational esoterics about what elements should actually be incorporated in the program.

An environmental education curriculum that responds to the public's concern over the problems relating to environmental degradation should be simple and straightforward. The major components of such a curriculum are outlined below followed by a brief explanation of each section:

Principles - Ecology
Problem - Land Use
Problem - Food
Problem - Energy Crisis
Problem - Pollution

The heart of any environmental education program must center around the transmission of the fundamental principles of ecology. When one realizes that most of today's environmental problems are caused by a violation of these basic ecological principles, it seems incomprehensible that many environmental education programs view ecology as peripheral or too technical to be incor-

porated in the mainstream of the program. We must get across to the general public the concept that the earth is blanketed with a marvelous tapestry of natural living systems. The patchwork effect is created by the distribution of different types of natural units called ecosystems. We must get across the idea that ecosystems have a structure and function which, in providing for their own long-term stability, render a series of tax-free services essential to the well-being and survival of mankind. We must also dispel the current idea that we should divide our problems into economic and environmental ones. The current idea that environmental concern costs us additional money is completely erroneous. At the present time, we are expending huge amounts of tax money to cover the social and environmental costs created by our devastation of natural systems. Since our accounting procedures only take into consideration direct costs and do not reflect the indirect costs accrued by environmental damage, it appears that environmental degradation has cost us nothing in the past and the prevention of it in the future will cost us very large sums of money.

In the broad philosophical, as well as the practical sense, all of our environmental problems can be traced back to our disruption of natural ecosystems. The disruption of these natural ecosystems has prevented them from performing the ordinary services so essential to human population. Examples of these ecosystem functions are energy flow, nutrient cycling, water purification, air purification, control of water supply, control of erosion, processing of waste, etc. A general understanding of the normal functions of natural ecosystems is absolutely essential before one can contemplate the problems that arise from disrupting these natural systems.

Once the student has a general familiarity with the functions of natural ecosystems it is more meaningful to study some individual problems and the consequences which derive from them.

One of the broadest areas related to environmental problems is land use management. The relationship between our uses of the land and the loss of natural ecosystems and their services can easily be explained following an introduction of the broad principles of ecology outlined above. In this segment of their curriculum the effects of large-scale farming and urbanization can be discussed indicating the prices we are paying for structuring our human society the way we do.

After a section on land use management, the problems of food shortages around the world can more easily be understood. The problems of food shortages can be shown to relate to the conversion of diverse natural ecosystems to simplify man-made systems designed with food production as the only goal. Furthermore, a discussion of food can serve as an introduction to the next section on energy through a discussion of the amount of fossil fuel energy required to maintain world food production at its current levels using modern agricultural techniques.

With the broad background that is included in the few segments of the curriculum described so far, one can begin to look at some of them for serious symptoms of our environmental problems. Our difficultues related to energy

consumption and reduced sources can clearly be shown to be symptoms of more general environmental problems at this point. In view of the dramatic effect that the energy crisis is having on our economics, politics and social interactions, it will be well to spend a considerable amount of time on this segment of the environmental education curriculum.

Pollution is a general symptom that should be treated in much the same fashion as energy. With the broad background provided above, pollution can be viewed as a symptom of the general environmental exploitation being conducted by human society. In the case of both energy and pollution, it is important to discuss the solutions to problems by concentrating on the causes rather than the symptoms of environmental degradation.

At younger age levels, the environmental education curriculum should focus primarily on an understanding of ecology and an understanding of how the ignorance of ecological principles has resulted in environmental problems of today. Solutions should be seen as straightforward solutions directed towards changing our method of exploiting environmental resources. Conservation, elimination of waste and wise use of our natural resources should be stressed. Older students should be exposed to the more sophisticated and complicated answers that are involved with respect to operating in harmony with ecological principles. From highschool age the economics, politics and sociology of correcting environmental problems should be explored in greater depth. The entire curriculum should concentrate on problems and their solutions with major emphasis placed on solutions. The environmental education curriculum must very quickly get out of the negative approach of enumerating the problems and move on to the positive aspects of practical solutions.

# THE DEVELOPMENT OF THE EARTH AND THE QUALITY OF LIFE

by
Karl E. Peters

Environmentalists, as well as many other people, have become increasingly concerned in recent years about the future of the space ship upon which we live, called Earth. Not only are we concerned about the future of the Earth itself, but also about the future of humanity, and not only about humanity's future in the sense of mere survival, but also about the quality of life that human beings will have. For the past few hundred years, Americans and Europeans have been developing the Earth. With the insights of science and the tools of technology, we have been using the Earth's resources to create a better life for ourselves. We are seeking not only to survive but to go beyond survival to living patterns of ever increasing quality. However, much to our surprise, and somewhat to our dismay, we have discovered that in some instances our scientific-technological development of the Earth has begun to diminish the quality of life.

I am not a scientist. I cannot give you tables and graphs to factually support what I have just said and will say. I am a philosopher and what I want to do in this paper is one of the tasks of philosophy--to try to define the phrase "quality of life" as a basic value that may be relevant for our futures. I also want to show how the quality of life may be both enhanced and diminished as we develop the Earth. In doing these things, I will be drawing on my own personal experience, which I hope is compatible with the personal, and also more scientific, experience of the reader.

Before we can describe the "quality of life" we must ask ourselves, what is life? What does it mean to live? Unless we are alive, it makes no sense to talk about the quality of life.[1]

To live means not only to exist but to exist in a good state of physical and mental health. By this I mean the full development of physical, intellectual, and other personal capabilities, so that one can function effectively in society and fulfill one's own personal life goals.

At this point the environmentalist has some cause for concern. If long lasting pesticides get into the food chain, onto the dinner table, and into the milk of mothers, it affects the healthy development of human beings. If our water is contaminated by inadequate waste treatment, or if there is simply not enough good water available in a heavily populated area, it affects our physical health. If we work in the chemical plant in Hopewell, Virginia, or in the coal mines of Appalachia, or breathe the smog in the "City of Angels", it affects our physical health. Environmentalists--or all human beings for that matter--have a right to be concerned about the development of the Earth when it contributes to the less than full health of people, because without physical and mental health, attaining the quality of life becomes more difficult if not impossible.

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[1] This distinction is similar to Abraham Maslow's differentiation between meeting basic needs or deficiencies and self actualization in Toward a Psychology of Being: (New York: Van Nostrand Reinhold Company, 1968), pp. 21-27.

To develop and maintain physical and mental health we human beings engage in what I call maintenance activities. We seek food, shelter, clothing, and relaxation. We have children so that life may continue in future generations. And in our own particular industrialized and urbanized society, the income we earn is the primary means by which we obtain the products to nourish, protect, and enjoy ourselves, and to support our families. It is important to recognize the role of economics, of earning a living in order to develop and maintain our physical and mental health. Here one of the crucial issues between environmentalists and the developers of technology and industry comes to a head. In many situations in which industry and technology are harming the environment, a slowdown or retooling of those industries is apt to result in layoffs of workers. Unless they can find other work their personal maintenance becomes a problem, with the further result that their quality of life may be diminished. Of course, the real solution is to provide employment in industries that will not adversely affect the environment, and the health of the employed and others in the surrounding areas. The point I wish to make here, however, is that the economic factor cannot be ignored, because personal income is one of the conditions in our society for maintaining physical and mental health.

If physical and mental health are maintained, then it is possible to live a life of quality. <u>"Quality of life" can be defined as the opportunity to maximize the breadth and depth of experience and achievement</u>.

Let me explain what this means. The maximization of the breadth of one's experience means having the most varied range of experiences possible within the limits of morality. This variety of experience may take many forms. One example of it would be having contact with a wide variety of people from different cultures and coming to appreciate their ways of living. Here science and technology have given us opportunities to travel to foreign countries, to view the magnificent variety of mankind's cultures on television, to read in some detail the writings by and about people quite different than we are. The opportunity for the maximization of the breadth of experience in such ways is more available to more people in our day than ever before in history. It is one of the beneficial products of the development of the earth by science and technology.

While one seeks a wide variety of experience as a part of the quality of life, one may also seek to experience the world in a more limited way but with greater depth--to focus on one aspect of experience to gain as much acquaintance of it as possible. One example of this is the scientist, who with the aid of more and more sophisticated technology, is able to probe ever deeper into a cell or atom--to discover worlds just as exciting as those discovered by travelers to foreign countries. For the scientist the technology that produces such things as the electron microscope improves the quality of life. Yet we should not forget that the depth of experience does not always require the kind of technology that uses material resources. Ancient religions have developed sophisticated technologies for exploring the various states of human consciousness; a Buddhist monk for example may, through the technology of meditation, achieve a depth of experience just as exciting as the modern

scientist.[2] And two friends may also achieve a depth of experience that is qualitatively rich.

In experiencing ourselves, other human beings, and the physical world we are living primarily in a passive mode. Although we engage in activities to put us in touch with things, we are still on the receiving end. To have high quality we must also have an active and productive side to our lives. We must achieve something. That something may be a new physical or intellectual skill--learning how to swim, ride a bike, play basketball, write a poem or a computer program, take a photograph, play a saxophone--learning to do all these kinds of things as best as we possibly can. With such acquired skills we may be in a position to create, to achieve something in our life that continues to exist in its own right, something others can see and say, "Look what he did," something that may even outlast our own lifespan to give us a kind of objective immortality. So the scientist creates his hypothesis in the hopes that it will become a verified theory, or at least will suggest something to another scientist who will find the explanation to the puzzle. The artist writes his novel, or perhaps a few poems just for friends. And educators present papers at conferences. Through the breadth and depth of our experience, and through our achievements great and small, we humans not only live--we acquire quality in our lives.

Earlier I indicated that before one can have the quality of life, one must have, as a prerequisite, physical and mental health. The basic needs of human existence must be met before one can start expanding the breadth and depth of one's experience, before one can acquire skills and create. However, one other thing is required before the quality of life is possible to any extent. One must be able to fulfill basic needs, and maintain physical and mental health, with the minimum expenditure of personal energy over the shortest range of time. The less time and effort one has to spend on basic maintenance activities, the more time and energy one has to experience the world and to create. Conversely the more effort and time one has to put into maintenance activities, the less time and effort one has to acquire qaulity in one's life.

This brings me to the basic point I wish to make in this paper. While the development of the earth through science, technology and industrialization has created a situation in which most of us have to spend less time on maintenance activities than did our forefathers, while this development has given us more time to travel, read, watch television, engage in athletics, take pictures, think about scientific problems, meditate, and create in thought and action, in some cases the development of the earth may reach, and perhaps has reached, a point at which the quality of life is actually dimished, because once again we have to spend more time maintaining our health and meeting our basic needs And the ironic thing is that, because of their impact on the environment, the creations of some people can actually make it more difficult for the rest of us to achieve and to experience the world.

Some of what I have already said illustrates this but let me explain further what I mean.

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[2]Although this use of technology may seem unusual today, it is legitimately based on the Greek root word, techne, which means art, skill or craft. One might usefully distinguish between "hard technologies" that operate on material things and "soft technologies" that deal with people's attitudes, perceptions, and values. Both types of technology will be necessary if we are going to resolve current and future crises involving the relation of man and his environment.

Although I have separated life maintenance activities from activities which are a part of the quality of life, often they are both. Scientists, artists, philosophers, and educators can both create and get paid for what they do. Thus, they are able to maintain themselves. But other people besides these also create and get paid for their achievements. Carpenters, bricklayers, contractors--and even heads of large scale land development corporations--are engaged in creative activity. The development of the earth is essentially an achievement, a creative enterprise--which gives to those who create a life of quality.

This point about the creative activity of builders was brought home to me eight years ago in Montclair, New Jersey, where my wife and I rented an apartment from an old retired gentleman. This man, an immigrant from Sweden, conveyed to us how pleased he was about the things he had accomplished in his life. Early in life he had been a construction worker on the railroads, and he was proud that he had helped to build something that was of benefit to others. But he was even more satisfied that he had been a contractor, and the pleasure with which he pointed out to us the houses he had built forty years before, which were still being lived in, was an indication of his satisfaction that he had done more than just exist. He had created something. His life had quality. Perhaps it is this way with many builders and land developers. They are earning a living for their own maintenance to be sure, but they are also doing something more.

However, the creative achievements of such builders has sometimes led to or can lead to a situation that restricts the quality of life for others, a situation in which people have to spend more time and effort in personal maintenance and have less personal energy left for breadth and depth of experience and achievement. Let me give a few examples.

When I was a boy, I remember my grandmother talking about how she as a child used to walk five miles through the woods to school. Today I make a similar five mile trip to Rollins College--a place where I not only earn a living but continually expand my experience through study and create lectures and papers. While it took my grandmother about one hour and fifteen minutes to walk to school, today, thanks to the creativity of Henry Ford and to the achievements of some fine road builders, I can drive the five miles in fifteen minutes. Compared to my grandmother, I save one full hour--two hours a day with the round trip--on what is essentially a maintenance activity of transporting myself to a school, a place where some quality of life can be realized.

But suppose that the development of the land in Central Florida continues--more people, more homes, more cars. It is conceivable that in the not too distant future it may again take me one hour and fifteen minutes to get to school. That is what it took when I lived in New Jersey and commuted to Manhattan. What then would I really have gained over my grandmother? Not only would I still be spending the same time in a maintenance activity as she did almost a century ago, but I would be caught in the stop and start driving of a long chain of high energy consuming, air polluting motor vehicles, hazardous to my health and hard on my nerves, while she, in her five mile walk to school, at least enjoyed the West Virginia brooks and woods. The development of the earth does not always improve the quality of life.

A second example: in Central Florida, since the coming of Disney World, an extensive development of the land has taken place. New homes, apartments, supermarkets, and shopping centers have accommodated a large influx of people into an area that is a very nice place to live. However, such development can lead to a real diminishing of the quality of life when the natural environment is not sufficiently taken into account. At the intersection of Interstate 4 and Route 436, which is a bypass around the east side of Orlando, a tremendous surge of development has occurred in the last five years--new homes, hotels, movie theaters, restaurants, and the biggest, totally enclosed shopping mall in Central Florida. In one sense it is a tribute to the capacity of some men to create. Unfortunately one mistake was made. It was built on a flood plain. And now, every summer and fall, when the heavy Florida rains come, the water from the surrounding area drains underground into the flood plain and oozes up out of the ground, into parking lots, and around day-care centers, flooding businesses, hotels, and homes. Of course, the people living there are upset. Why? Because they have to spend more time than most on the maintenance activities of coping with the floods and keeping their homes in order. And because of this their opportunity to maximize the breadth and depth of experience and achievement is diminished. The development of the earth does not always improve the quality of life.

The issue that we have been looking at may be approached from another angle. If we as human beings are not just trying to live but are trying to have a life high in quality, we might ask the question, "Quality of life for whom?" This question first arises on a small scale, because in the examples I have just given some people realize a life of high quality at the expense of others. The major land developers who build on flood plains not only create but the income they get from their efforts helps them to maintain themselves more efficiently, which enables them to expand the range of their experience. Yet, the maintenance activity of others increases as a result. Secondly, the question, "Quality of life for whom?" arises on a very large scale. Our society as a whole, with its sophisticated technology and industrial institutions, is rapidly using up resources from around the world in the creation of a lifestyle in which there is more opportunity for expanded experience and achievement than anyone else has ever known. At the same time there are many who not only do not have such a quality of life but who are suffering the more basic problems of poor physical and mental health. Many do not even have <u>life</u> as I have defined it, much less the quality of life. The issue then is, what right do some of us in the United States have to enjoy a life high in quality while the quality of the life of others in our country is diminished? Or what right do we the people of the United States as a whole have to enjoy a life of high quality while elsewhere in the world there are many who are barely existing? Finally, the question, "Quality of life for whom?" arises when we look to the future. What right do people on earth today have to develop the earth in such a way as to destroy the natural environment, so that future generations are once again, as were our ancestors, struggling simply to maintain themselves at a more "primitive" level of existence?

At present I can only ask this question. I have no clear-cut answer, but I do have one, perhaps important, observation to make. Although I do not wish to underestimate the tremendous problems many people in our world today have in simply living, I also do not think that we should let ourselves be caught in the arrogant position that we in the western world have the best kind of life, high in quality, while others who live in a so-called more

"primitive" state, today or in the future, have no quality at all. In fact, as we approach the twenty-first century and the possibility that we might run out of many of the resources that have made possible the high quality life we now have, we might turn to the more primitive type of life style, as exemplified in earlier societies, to see whether or not it is possible to maximize the breadth and depth of one's experience and achievement without being so dependent on science, technology and industry.

Since I am not an anthropoligist with data on primitive cultures, let me try to make my point with a closing example from my own personal life. My wife and I are fortunate enough to live on a lake. We, like many others, have invested some of our extra money in a power boat, which we use to take visitors around the lake and for some water skiing. The power boat is a relatively new invention, but our neighbor has a much older mode of water transportation, a canoe. About a month ago my wife and I decided to take his canoe out for a sunset ride. Our small lake was entirely calm. No one else was on the water. As we canoed silently along the shore we enjoyed the sounds of the evening, the sunset, and the quiet conversation between ourselves. I was amazed at all the things I saw and heard that I had never seen and heard before--certainly never in my power boat. And I began to wonder, what really is the use of a large power boat in achieving the quality of life? I suppose on a river it can take us somewhere where we might expand our experience. It also enables us to develop the skills associated with water skiing, and at 30 miles per hour one can experience the wind rushing by and the noise of the motor. But if one is really seeking a wide variety and depth of experience close to home, perhaps the canoe, which has been used by the so-called primitive people for thousands of years, brings just as much quality into one's life as the power boat. Perhaps the quality of life doesn't always depend on science, technology, and industry. Perhaps the development of the earth as we have been doing it for the past few hundred years with a costly expenditure of energy is not the only, or even the best, way to achieve a life of high quality.

# INTERNATIONAL DILEMMAS

by
Robert N. Saveland

The Second Report to the Club of Rome has been available for almost two years and has had wide circulation. Mankind at the Turning Point, as a sequel to Limits to Growth, has generated conference discussions (The Woodlands in October, 1975) and new editorializing (The Christian Science Monitor, April 15, 1976). In spite of rather widespread attention in news magazines and in periodicals catering to our intelligentsia, it has been my observation that both reports have been unknown to many school teachers whom I have queried on the subject. Admittedly, this is a rather random and small sample, and one wonders what a large scale study might reveal. I suspect, however, that there is a communications gap of some proportions here.

With reference to whether or not mankind is at the turning point, it should be noted that most every generation sees its own time as especially crucial. As a young graduate student, I particularly recall reading Harold Rugg's, Now is the Moment (1943) and Paul Sears', Deserts on the March (1935). Well, the deserts are still on the march and the authors of the Second Club of Rome Report, Mesarovic and Pestel (1974) conclude in their Epilogue:

> The current crises are not temporary, but rather reflect a persistent trend inherent in the historical pattern of development (p. 143).

To this, many environmentalists would respond, "Yes, but the time is getting short".

A strictly factual answer to whether or not a world environment "crisis" exists, or is impending, is difficult to obtain even though Forrester's computer simulations have provided debatable guidelines. When Aldrich and Blackburn addressed the question, "Should we believe that our planet is in peril?", they reported: (Muessig, 1975, p. 241):

> Apathy, frustration, anger, and dismay characterize the citizenry, young and old, affluent and indigent in urban and rural communities.

Rederick Nordell (1976, p. 14), in a series called "Voices of America" running in the Christian Science Monitor came to a somewhat different conclusion after 6000 miles of bus and plane travel to record the thoughts of Americans nationwide. He found:

> The American people are entering this election/bicentennial year with
>
> Pride--and some shame--about their country's past.
>
> Dismay--and some satisfaction--about its present.
>
> Uneasiness--and a quenchless residue of confidence--about its future.

Many would agree with Jay W. Forrester that debate about the physical limits to growth is counter-productive (Nicholas Wade, 1975). I would add to this that terminology which refers to "using up" resources, or references to "exhaustible and non-renewable" resources, are misnomers. Although resources are too frequently converted into forms which render them economically irretrievable with present technology, except for a small amount of space hardware, these resources have not departed Planet Earth.

Let us turn to the second point which Mesarovic and Pestel make in their Epilogue:

> The solution of these crises can be developed only in global context with full and explicit recognition of the emerging world system and on a long-term basis. This would necessitate, among other changes, a new world economic order and a global resources allocation system. (p. 143)

The world food problem exemplified a dilemma here--a problem of scale. The varying scales are depicted graphically by Blackburn and Aldrich's "environmentally oriented radar scanner" which shows home, community, state, region, nation, continent and globe as ever-explanding concentric rings around I, or self, which they refer to as the Psychesphere. (Muessig, 1975, p. 253) They suggest that students put blips in appropriate parts of the scanner in studying environmental problems. It can be seen that a famine in Biafra would activate blips in several parts of the scanner, thus at many scales. Margaret Mead (1976) has dramatized this point in a different way in her new book, World Enough: Rethinking the Future, which she calls a "macroscope" for scrutinizing the problems. Photographs are arranged to offer sudden illumination of the scale of these problems. Psychologically speaking, circumstances and happenings at a distance are usually of less concern than those near at hand--the distance-decay principle. In other words, people tend to give little attention to a matter until it begins to affect them personally. The environmentally oriented radar scanner and the macroscope are two devices for fostering a feeling of interdependence so necessary when developing concepts of scale and global understandings.

The Second Club of Rome report makes a significant contribution in presenting a Regionalization of the World System. Mesarovic and Pestel point out that the multi-level model is necessary since the world is not homogeneous (p. 39). Crises, therefore, occur on a regional level, such as the failure of a wheat crop in the Soviet Union, but their effects are noted on a global, as well as a personal level (in the higher cost of bread in the United States).

In the second part of point 2 above, Mesarovic and Pestel say that the solution to crisis situations depends on a new world economic order and a global resources allocation system. This is expanded in point 3 which says that "solutions cannot be achieved by traditional means" and point 4 which affirms that "it is possible to resolve these crises through cooperation rather than confrontation" (pp. 143-144).

People from other cultures might place quite different interpretations on this call for a new economic order. Russians may feel that they already have a solution. What modes for the exchange of resources could be envisioned from a Chinese, Japanese, Italian, South African, or Argentinian viewpoint? It should here be recalled that existing systems are not static, and certain "new" forms have emerged in recent years.

Although antecedents go back at least to charter and stock companies in colonial times, the Multi-national or Global Corporations have grown to larger proportions in the last two decades. As centers for decision-making, they can have considerable impact on environmental matters in all parts of the world. It is of interest to note that, following the Stockholm World Environment Conference, the International Chamber of Commerce (which has many multi-nationals as members) instigated the creation of ICIE, the International Center for Industry and the Environment. This organization is located in Nairobi where it can conveniently interface with UNEP, the United Nations Environment Program. The anti-industry skeptic could refer to ICIE as either a "watchdog" or a "super lobby".

At least 18 books on multi-national corporations have been published since 1969. It is clearly impossible to summarize these here, but a few issues and dilemmas can be identified. Recent exposures of the payment of bribes in Japan and elsewhere have raised moral and ethical questions about the operations of multi-nationals. This has led to a UN Commission on Transnational Corporations which is attempting to draw up a Code of Conduct.

Daniel P. Moynihan has called MNC's "arguably the most creative international institution of the 20th Century" (Wilson, 3/31/76). Howard V. Perlmutter, a Wharton School of Finance professor, predicts that after 1990 the "key actors" in the world will be "multi-state supergiant stateless transideological firms, and global industrial-financial service system constellations and coalitions". (Francis, 11/4/75) The issue as identified by Jacques Maisonrouge, head of I.B.M. in Europe, is the "conceptual conflict between the global optimization of resources and the independence of nation states". (Ibid) The fact is that currently the gross sales of many of the world's largest companies are greater than the gross national product of a number of member states in the United Nations. Notwithstanding, the companies inevitably operate by the sanction of governments, and expropriation can be threat, or reality.

In the United States, a Gallup Poll has shown that big business ranks in last place in public confidence. (Javits, 3/24/76) A search for reasons for this situation would take us back at least to the Muckrakers and Ida M. Tarbell's (1925) History of Standard Oil. The current behavior and stance of large corporations reinforces unfavorable opinion in certain environmental instances, as in the case of Allied Chemical and Kepone Manufacturing in Hopewell, Virginia (Reitze and Reitze, 1976) or in the Kaiparowits controversy. Like the good teenager, the good corporation is generally not newsworthy. When Nader's Raiders conducted a blitz investigation of Savannah River pollution this made national television. When the Union Camp Corporation spent $17M for an aeration lagoon, it went largely unnoticed except by the residents of Savannah who noted a marked improvement in the quality of the water along the riverfront.

The fact is that corporations are made up of individuals, albeit the corporate manager appears to fit a stereotyped role. The profit motive has been much maligned, still it is only through making profits that corporations can carry out their social responsibilities. There are indications that MNC's are going to be around for a while. In their chapter on "The World Corporation or Supra-national Company", Becht and Belzung (1975) conclude:

> Making global corporations into useful world citizens, to serve mankinds needs and wants, is the task of all individuals. These corporations may well be the hope and promise of a means to allocate resources on a world-wide scale--without nations resorting to war or threats of war. (p. 318)

One of the more serious problems with MNC's is that important decisions are often made far from the local scene. I think particularly of a management decision in New York which resulted in the closing of a shrimp-processing facility in Savannah. This necessitated trucking the off-loaded shrimp from the boats to a larger processing plant 70 miles away in Brunswick, all in the name of efficiency. When repeated many times over, as in Termination: The Closing of the Baker Plant (Sloate, 1969), one comes to agree with E. H. Schumacher (1973) that Small is Beautiful.

The dilemma facing humanity in learning to live on a small planet was the subject of an International Symposium at Expo '74 in Spokane, Washington (Dalen and Tipton, 1974). Among the presentations were the mystic-religious, economic growth, preservationist, limits to growth, Third World, and harmonizing viewpoints. Another viewpoint which does not seem to fit any of the above classifications is that of the columnist, William Rusher, who put forth the following ideas in a column on April 20, 1976:

> The Club of Rome, in case you had forgotten, is the predominantly European Bunch of tycoons, professors, and miscellaneous busybodies who back in 1972 tried to scare the world not only out of a year's growth but out of all growth whatever. Its gimmick was a study it had commissioned up at M.I.T. . . . . The Club of Rome's "solution" to this imaginary dilemma...was for the world's developed nations to throttle back their own economic development, while feeding the Third World with both hands so it could catch up....
>
> This time the gimmick (it always has a gimmick) is the "new, major study" it has commissioned by Professor Jan Tinbergen of the Nethelands....While it won't be released until next October, its major recommendations have already been half-disclosed by officials of the Club of Rome, who obviously appreciate the PR value of a good leak these days.
>
> ...The report will call, as its discredited predecessor did, for outright transfer payments of vast sums of money from the developed nations to the countries of the underdeveloped world, plus heavier reliance on (of all things) the United Nations.

Environmental activists have always been embroiled in controversy, but the crescendo of counter attacks seems to be rising. At one time the environment was politically sacrosanct, on a plane with Motherhood. Now, in some quarters, it is a dirty word.

At the end of the six o'clock news on Tuesday evening, March 30, 1976, WSB-TV, Atlanta, ran a cartoon by Bill Daniels portraying the opponents of the Concorde SST test flights to the United States as running heedlessly from imagined perils. In response to my letter objecting to such personification, Mr. Daniels replied, "I see experimentation with craft such as the SST as progression toward the transportation vehicle of the future which I believe to be some adaptation of rocketry. Let's try it--find the bugs in it and accept or reject it accordingly". He could be right!

On Tuesday, April 13, 1976, the Christian Science Monitor ran an article, "Smoother political weather bringing SST to U.S." In the article, Peter Stuart pointed out that environmental lobbyists have been outgunned by Concorde lobbyists in Congress. The latter have more money and professional help behind them. He states that the legislative battle against the plane is now conceded to be virtually

lost and scheduled flights are due to begin on May 24th. However, the court battle is just beginning with a brief filed in the U. S. Court of Appeals by by the Environmental Defense Fund.

The SST issue dramatizes another facet of the dilemma in international environmental education. How many school teachers were teaching the possibility of supersonic commercial air service ten years ago--although the Concorde project has been underway since 1962? I am now somewhat embarrassed by the fact that in 1968 I published a book (Saveland, 1968) with an artist's sketch on the cover of a Concorde airliner lifting off the runway of the International Airport at Hong Kong. Mesarovic and Pestel make this point although in a different context, when they write:

> Due to the extended dynamics of the world system and the magnitude of current and future change...actions (on major issues anywhere in the world) have to be anticipatory so that adequate remedies can become operational before the crises evolve into their full scope and force. (p. 31)

Anyone who has speculated in the futures knows what a risky market it is. While education can help in discerning trends and identifying alternatives, it has seldom been used to speculate on the future. Its orientation has been to the past.

The dilemma of a future-oriented education is that it departs from the solid ground of observable fact and enters into the never-never land of speculation and hypothesis. The educator's answer to this dilemma is to teach a process. There is nothing too new about this, it is also called the scientific method. For more than a decade in the United States there has been considerable attention to the process method as evidenced by all the writing and conferences which have focused on inquiry and values and valuing.

Now for more bad news. On April 14th a UNEP conference ended in Nairobi. A topic for discussion in the corridors was the financial plight of the program. The organization had $13M at the beginning of 1976 and most of this is now committed. When this is gone, UNEP will be without funds unless the U. S. Congress passes a $7.5M appropriation under consideration. In 1972 the U. S. agreed that it would contribute 40% of the UNEP budget. If the current appropriation is passed, the U. S. will be providing 28% of this year's budget. However, the Organization of Petroleum Exporting Countries (OPEC) have contributed very little to UNEP, and Venezuela and Libya have given nothing. June Godwin (1976) writing from Nairobi, tells of the winged ants that flutter up from the ground once a year when the first rains come to the region. They fly towards lights until exhausted, then drop to the group where they shed their wings and crawl away to lay eggs and die. Is this the fate of international environmental education?

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